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AMERICAN JOURNAL OF OPHTHALMOLOGY

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PRECHIASMAL INTRACRANIAL TUMORS OF THE OPTIC NERVES.

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This paper gives a general discussion of prechiasmal tumors of the optic nerve; and reports two cases with the pathologic findings, and the conclusions drawn from the author's experience. The detection of this lesion is the direct outcome of an address delivered before the Hartford (Conn.) Academy of Medicine, on the diagnosis and localization of brain tumors. Dr. F. L. Waite and Dr. E. Terry Smith, who had been attending these patients, then suggested the possibility of an intracranial tumor. From the Department of Surgery, of the Johns Hopkins Hospital and University.

The two cases which form the basis of this paper are presented because I believe they represent a type of lesion which may be responsible for many cases of unexplained blindness, and because with proper treatment of the cause, the vision may be more or less completely restored. The lesion in question is an intracranial tumor involving the prechiasmal segment of the optic nerves in the neighborhood of the optic foramina. Postmortem records establish a group of cases fundamentally similar, but I have found no record of the clinical diagnosis of such a lesion and none, therefore, in which such a tumor has been treated surgically. There is a very definite and important pathologic relationship between these tumors and those of the intraorbital division of the optic nerve. This relationship, long obscured by the paucity of postmortem examinations and the proper correlation of those which had been made, now becomes of the greatest practical concern in all tumors involving the optic nerve, for not only does the eyesight but quite frequently the life of the patient depend upon a correct diagnosis and adequate surgical treatment.

The diagnosis of a prechiasmal tumor of the optic nerve is at present none too sharp and at best there is an element of uncertainty, but the early stage at which the diagnosis of these first cases has been made, encourages the hope that the history and the signs, altho few, may be sufficiently definite to lead to the recognition of the lesion with greater precision, and before the advent of those late and hopeless manifestations which indicate the spread of the tumor either into the orbital cavity or into the brain. In the two cases which are presented here, the tumors were so small and so precisely confined to the optic nerve, that the location of the growth was not betrayed by any signs of intracranial pressure or by involvement of the optic chiasm thru extension of the growth posteriorly, or by exophthalmos from its extension anteriorly. In one case, the clinical picture was that of gradual blindness, and nothing else; not even was there a suggestion, either by signs or symptoms, that an intracranial lesion was present: in the other, there were superimposed features which conformed to no recognized lesion but which, in general, indicated an intracranial disturbance. In one case, the vision returned from blindness to normal in less than two weeks after the operation; in the other, there was considerable return of sight after a partial removal of the tumor.

The presentation of a definite pathology for a group of cases of blindness of obscure origin, is particularly pertinent at this time when the literature is surfeited with articles on "optic neuritis." It is not to be inferred from this statement that I look upon optic neuritis as the false conception which has been claimed in rather heated discussion by very able authorities. The

existence of this clinical entity is undoubted. It is backed by evidence too conclusive. I have had several instances in which the optic neuritis has been substantiated by pathologic proof. However, as is true in all new discoveries, it is most unfortunate that such extravagant claims are made upon very hasty and fallacious observations and accompanied by no objective demonstration of pathology—opinions, on the whole, dominated by an over zealous personal equation. Eventually, of course, optic neuritis will settle down to a concrete clinical entity with a well defined pathologic basis, but until then patients innumerable are doomed to useless, dangerous, even fatal rhinologic operations, and many are sidetracked from the detection of the real cause of their ailment until the lesion has grown beyond the pale of operative assistance. As long as optic neuritis remains a diagnosis of exclusion, as it is so largely at the present time, this exclusion demands the collaboration of experts who are thoroly competent to exclude. Intracranial tumors have too frequently been missed by over zealous enthusiasts searching for optic neuritis. Over eager neurologic surgeons, also, are by no means blameless, for too many cases of optic neuritis have been subjected to needless cranial surgery, under the impression that a brain tumor existed. But on both sides the fault lies with the individual. Our means of diagnosis, tho still far from what they should be, are nevertheless adequate to eliminate all but the exceptional cases from these errors.

The differentiation between a mechanical swelling of the optic disc—"choked disc"—and an inflammatory swelling of the disc—optic neuritis—is only too frequently impossible by ophthalmologic examination. But what information is lacking with the ophthalmoscope, can usually be compensated by a careful history and by other examinations. At times, of course, the differentiation between an optic neuritis and a brain tumor may not be easy, but it should always be possible and without risk to the patient. Speaking from the standpoint of a neurologic surgeon, I can say that any brain tumor which can cause a choked disc can be accurately diagnosed and precisely localized; and conversely, it can be told with equal accuracy when a tumor is not present.[1] And, I believe, infections of the nasal sinuses can also be detected or eliminated with a high degree of accuracy without resorting to rather blind exploratory operations on the paranasal sinuses. There is, therefore, little excuse in confusing these lesions. The mistakes are made by those who are not thoroly competent to pass upon intracranial or rhinologic conditions. The differential diagnosis between a prechiasmal tumor and an optic neuritis will be considered later.

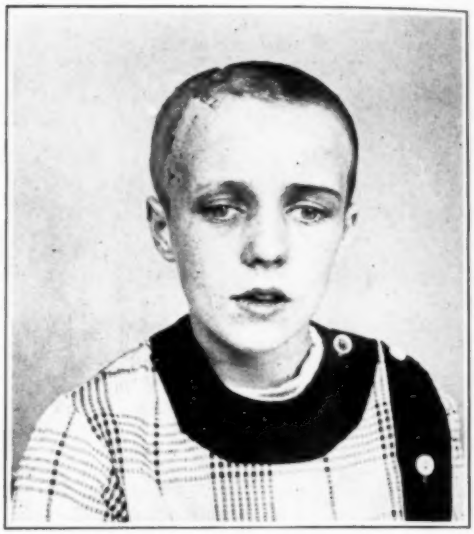

Fig. 1.—Photograph of patient 2 weeks after removal of right prechiasmal tumor. Note the slight divergence of the eyes; this has been present for several years.

CASES.

The history and operative findings on the two tumors of intracranial portion of the optic nerve are as follows:

CASE 1. Mary C., referred by Dr. F. L. Waite of Hartford, Conn., is a very bright and physically normal girl of 13. (Fig. 1.) When 7 years old, or 6 years before admission to the Johns Hopkins Hospital, she had a spell of vomiting lasting a week. There was

no associated abdominal pain or other disturbance which should accompany an acute abdominal ailment; but during this period of vomiting, diplopia this time, dimness of vision first appeared in the right eye. There was no pain or aching in the eyeball and none referred elsewhere. Little fur-

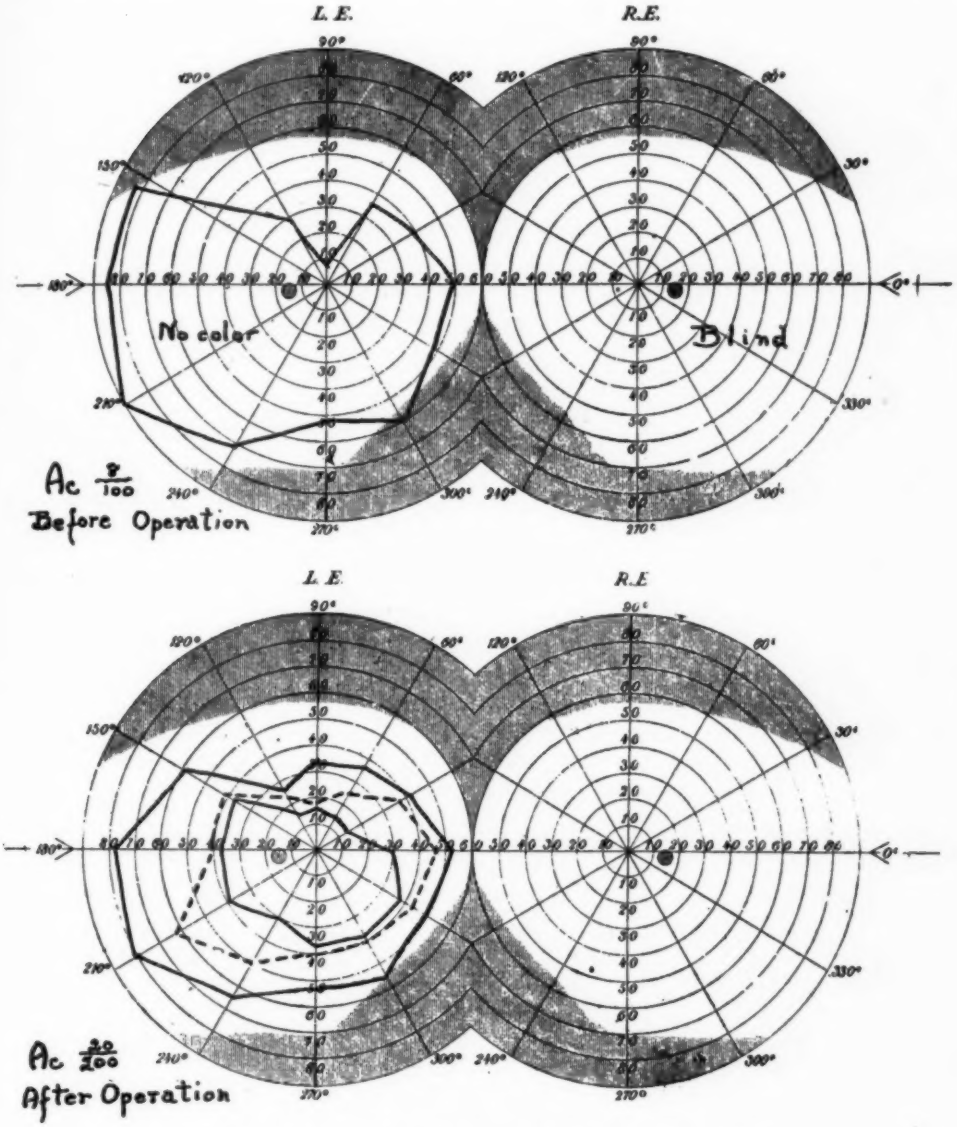

Fig. 2.—Visual fields of patients before and after removal of tumor.

developed and the left eye turned distinctly outward, demonstrating the intracranial origin of the vomiting. There was no headache associated with the attack. Within a week the crossed eye had returned to normal. About ther change developed until 3 years ago, when, during a mild attack of influenza, another vomiting spell persisted for several days and again the right eye became crossed. The vision was then so much impaired that she had

to quit school. The crossed eye gradually returned to normal. During the past three years, there have been three additional attacks of vomiting, each lasting nearly a week, and at each time *both* eyes were crossed. Coincident with the strabismus there has been drooping of the upper eyelids—apparently bilateral. Altho some improvement in time she first consulted him. At that time (1918) the vision in the left eye was 20/60; failing gradually, it was 10/200 in March, 1920, and 8/200 in June, 1920, and was the same on admission to the Johns Hopkins Hospital (April, 1921). *Patient has never had a headache in her life* and, except for the loss of vision, would be "in fine shape."

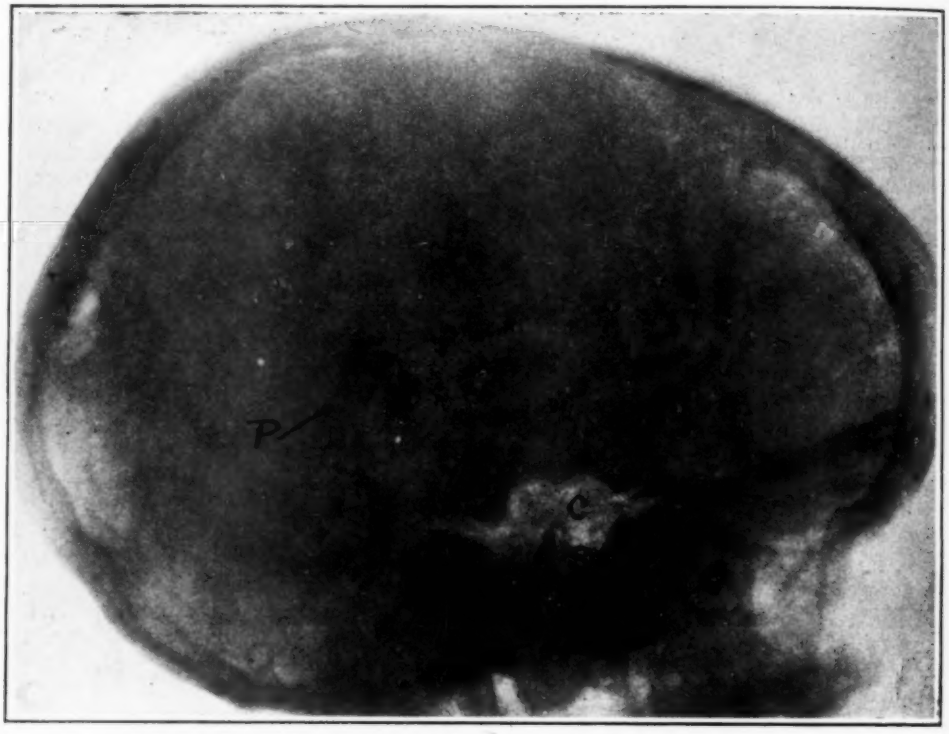

Fig. 3.—X-ray photograph of Case 1. P probable pineal shadow which is exceedingly large. C large cisterna chiasmatis filled with air. (The shadows have been intensified.) S sella turcica, slightly larger than normal. Air-filled sulci are seen over the frontal region.

the strabismus has been noted following the subsidence of the vomiting, a more or less permanent weakness of the eye muscles has persisted and varied in intensity from time to time. During the past three attacks, there has been a little aching in the eyes, but this subsided with the disappearance of the vomiting. Exophthalmos has never been noticed in either eye.

The loss of vision has been very gradually progressive in both eyes, but more in the right. Dr. Waite's careful notes show that she was blind in the right eye at least 3 years ago—at which

From the physical, neurologic and special examinations, the following positive and negative items are summarized:

1) The right eye is totally blind.

2) The visual field for form was preserved in the left eye, but was somewhat contracted; visual acuity—8/200; complete loss of color perception; no hemianopsia. (Fig. 2.)

3) Both optic discs have a brilliant atrophic pallor; the margins are sharply defined; the lamina cribrosa are very distinct; there is no choked disc and no change in the size or shape of the retinal vessels.

4) The right eye moves outward, inward and slightly downward, but not upward. The left eye moves laterally, slightly downward, not medially or upward. There is a slight but definite ptosis of both upper lids. Both pupils react fairly actively to light, directly and consensually.

5) There is an unusually large calcified shadow of the pineal body (roentgenogram). (Fig. 3.)

6) The sella turcica is slightly but distinctly enlarged; it is rather cone shaped with the base of the cone upward.

7) The size and position of the lateral ventricles are normal (pneumoventriculography). (Fig. 4.)

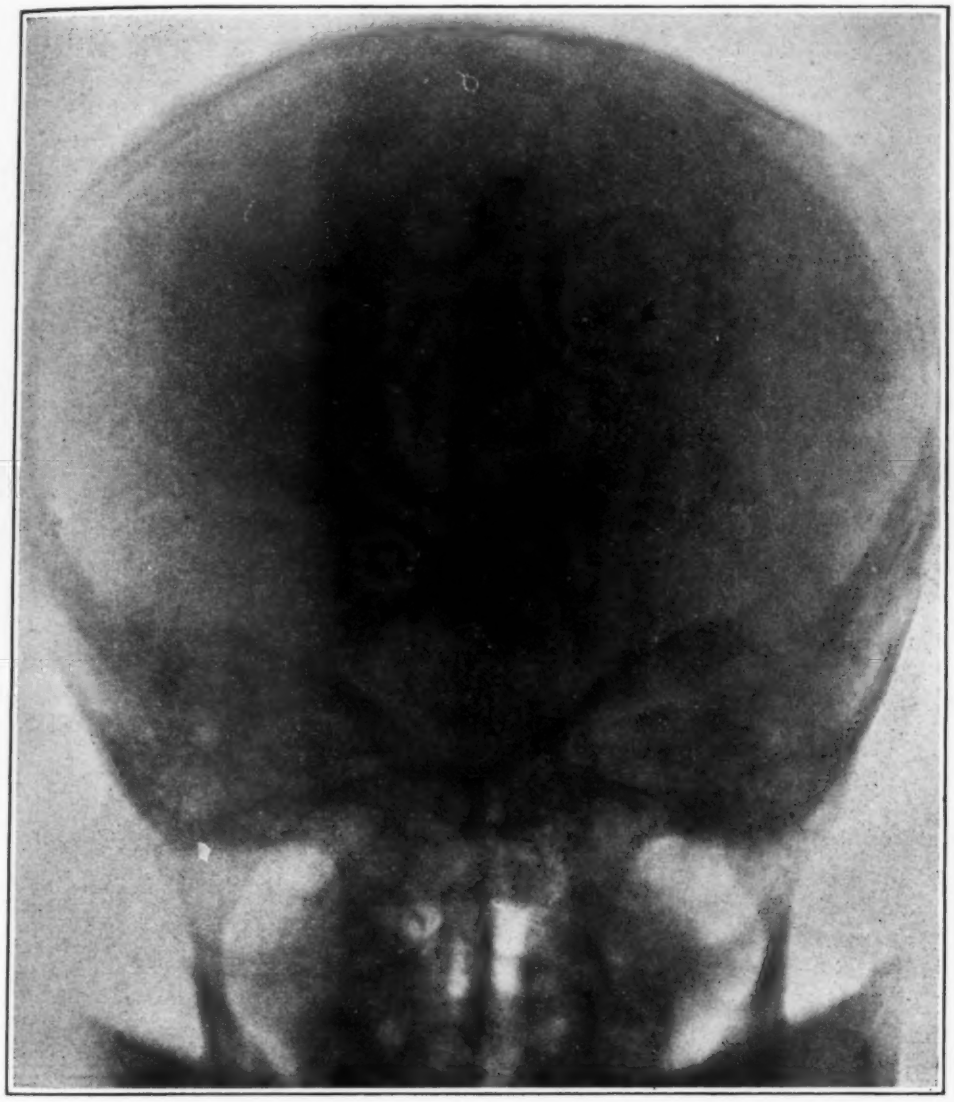

Fig. 4.—Pneumoventriculogram of Case 1 to show the ventricles which are of normal shape, size and position. This precludes the possibility of a tumor of the pineal body.

8) The examination of the cerebrospinal fluid was negative. The Wassermann reaction from both the blood and cerebrospinal fluid was negative.

9) The paranasal sinuses were entirely negative.

REASONING TOWARD A DIAGNOSIS.

Despite the absence of headache, there was reasonable certainty in the diagnosis of an intracranial lesion, because of the transient bilateral extraocular palsies which always accompanied the spells of periodic vomiting. The fleeting character of the ocular changes indicated a lesion which varied in size. An intracranial lesion giving such variable signs is most likely a cyst or some abnormal collection of cerebrospinal fluid. The progressive blindness extending over such a long period of time seemed to indicate a tumor. But where could there be a tumor which would produce bilateral palsies of all the extraocular muscles and at the same time a bilateral loss of vision approaching blindness and at the same time without hemianopsia? The large extraordinary

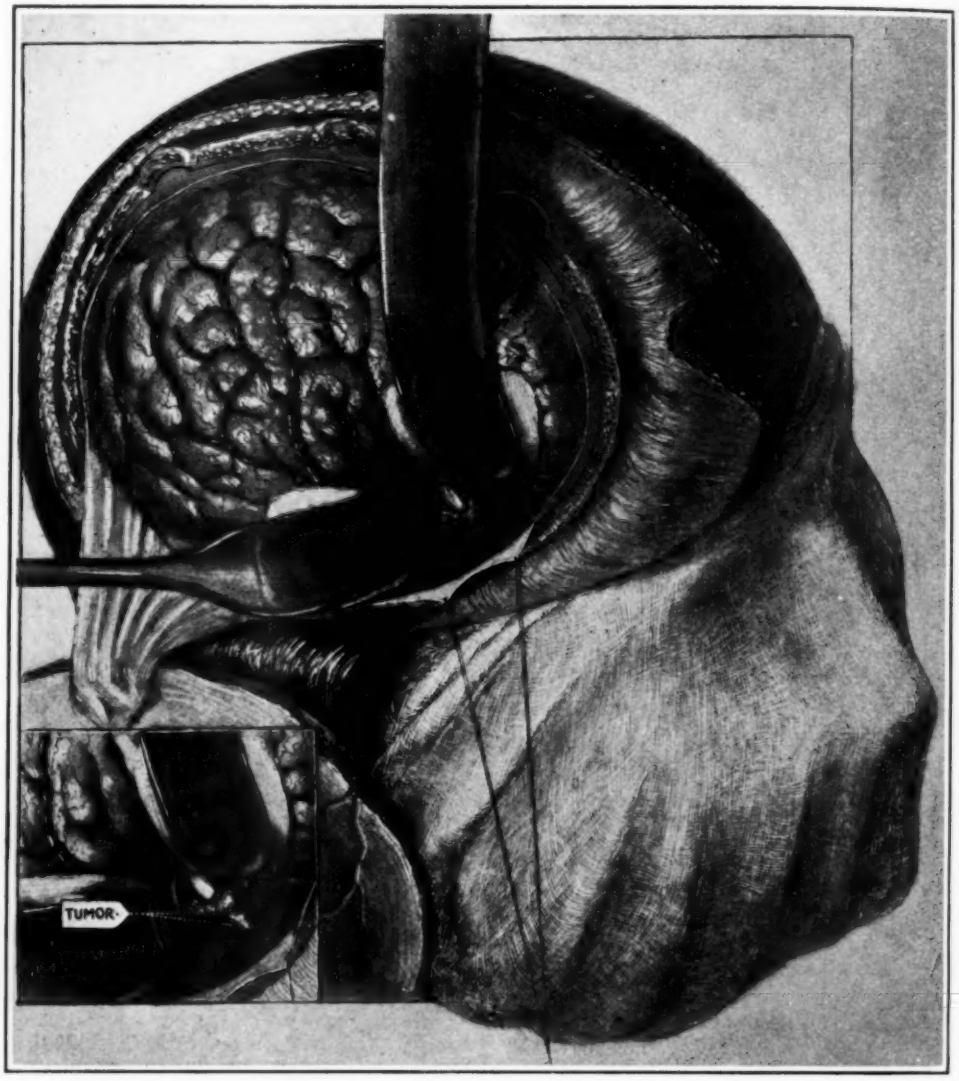

Fig. 5.—Showing operative exposure of prechiasmal tumor around the right optic nerve at the optic foramen. The carotid artery is shown just behind the optic nerve and the tumor lies between the optic nerve and the carotid artery. The insert shows the exposure of the tumor in the right optic foramen and in the right orbit after removal of a segment of the orbital roof.

shadow in the pineal region was suggestive of a tumor of the pineal body (Fig. 3), especially since a growth in this region would readily explain the bilateral changes in the eye muscles, and it could also explain the transient character of these disturbances. But a pineal tumor would cause blindness only if a hydrocephalus existed, for all pineal tumors produce symptoms of intracranial pressure only thru the secondary effects of hydrocephalus, which results from occlusion of the subjacent aqueduct of Sylvius. A choked disc and changes in the vessels of the retina would be expected, tho not necessarily demanded, of a pineal tumor which produced hydrocephalus; but a hydrocephalus was positively excluded by cerebral pneumography—the lateral ventricles being entirely normal. (Fig. 4.) If there was a pineal tumor, it certainly was not causing blindness and, for the same reasons, it was not causing the ptosis, for the nuclei of the third, fourth and sixth cranial nerves could be reached only after the aqueduct of Sylvius had first been compressed.

Could all the findings be explained by a tumor elsewhere? In only one other location could a growth give bilateral ptosis and extraocular palsies at the same time, i. e., in the region of the sphenoidal fissure, thru which the third, fourth and sixth nerves pass into the orbit. But a tumor in this region must be very wide to involve these nerves on *both* sides, so large in fact that intracranial pressure would certainly have existed. Moreover, the olfactory nerves should have been affected, but they were not. Such an hypothetically located tumor also made it difficult to explain the vision which was still present, for the optic nerves necessarily would have been in the center of a very large tumor mass. Moreover, the size of the sella was only slightly greater than normal; the posterior clinoid processes were not destroyed, so that the existence of a tumor of any size in this region was almost precluded; and if a pituitary

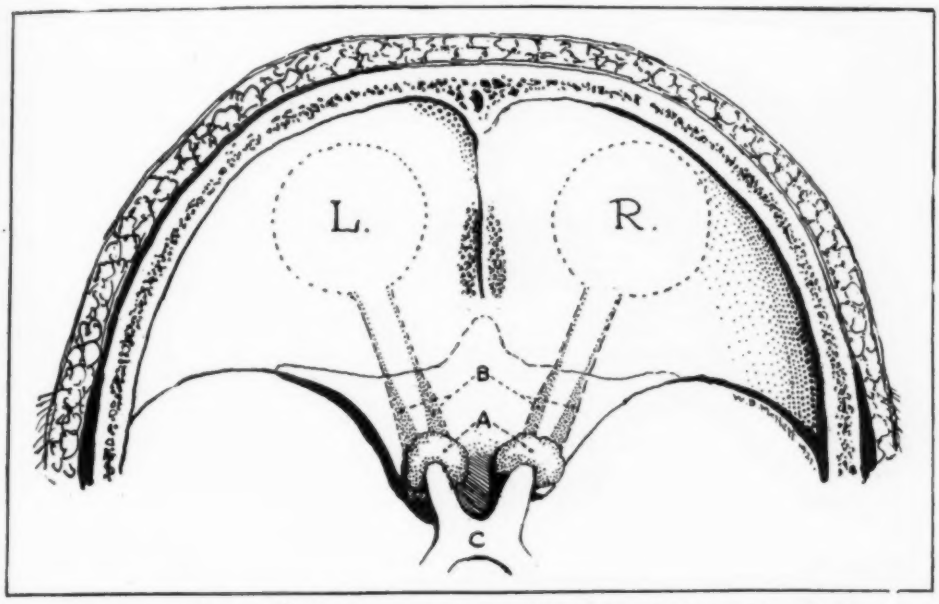

Fig. 6.—Diagram showing the position and size of the tumors of the optic nerve. Tumors are symmetric collar like growths surrounding each optic nerve at the optic foramen and passing forward into the orbit.

tumor should be present (almost an impossibility) why no evidences of hemianopsia?

The presence of a primary optic atrophy could not be questioned, therefore a tumor must be located somewhere along the optic nerves, and presumably between the optic foramina and the chiasm. Any form of toxic neuritis advancing so slowly and so progressively, seemed inconceivable; moreover, the paranasal sinuses were normal.

Fig. 7.—Photograph of second patient a month after the tumor on the left optic nerve was exposed by this intracranial approach. A palliative operation was done, incising a scar which bound the optic nerve to the tumor; this relieved the patient completely and restored his sight to normal.

At operation, two entirely independent tumors were found (Figs. 5 and 6), one completely surrounding each optic nerve at the optic foramen. The growths were small, almost perfectly symmetric, collar like growths. They were pale grayish pink, not unlike granulation tissue; the periphery of the growth was rather fluffy, much like seaweed, but toward the nerve it became quite firm. The entire diameter of each tumor including the optic nerve was about 1.5 cm.; posteriorly it extended along the nerve about 0.75 cm. and was very loosely attached except at the point where the dura is reflected. The tumor also grew thru the optic foramen into the orbit for a distance of about 1.5 cm., but it extended only as a linear strand in the orbit and did not surround the nerve. Here also it was merely adjacent to and not adherent to the nerve. The optic foramen did not seem enlarged. The intraorbital course and extent of the tumor on the left nerve could not be followed, for the orbital roof was not opened, but the intracranial appearance of the two tumors was practically identical. The tumor on each nerve arose from the dural sheath and in its slow fibrous growth had gradually constricted and strangled the optic nerve. The growths were not perfectly circular. Each budded externally as a small nubbin, and possibly may have abutted on the structures which passed thru the sphenoidal fissure, but this lateral extension was so tiny that such a nerve involvement was neither visible nor scarcely conceivable. The finding to which I am more inclined to attribute extraocular palsies is the big collection of fluid surrounding the tumor—undoubtedly a compensatory product which formed to protect the brain from this intrusive foreign mass. Nature has a well known method of surrounding the surface of many tumors with a bed of fluid which acts as a buffer between the neoplasm and the brain. All cerebello-pontine tumors are so covered. The principal reason for the belief that the pocket of fluid was responsible for the strabismus is that it was certainly responsible for the transient attacks which dated back several years, lasted only a few days and were always associated with vomiting. Palsies following the direct growth of the tumors would have persisted and increased and the growth was too gradual, and even in its final size too small, to have produced either the sudden transient disturbance or the permanent weakness of these muscles. The solid tumors were also far too small to produce vomiting or any signs of intracranial pressure. This collection of fluid was really an extension of the cisterna chiasmatis. (Fig. 3.) Another striking feature was the length of the optic nerves, a finding which one sees in all pituitary tumors when the chiasm has been lifted up and pushed backward, stretching the optic nerves as they grew; and in this particular instance the elongation of the optic nerves was possible only from the pocket of fluid, for the tumors extended less than half way between the optic

foramina and the optic chiasm. After the release of this big collection of fluid, the entire sella turcica and the suprasellar region could be readily inspected without traction on the optic nerves. This inspection is not easy unless the optic nerves have been stretched and unless the cisterna chiasmatis is greatly enlarged. Doubtless, the slightly enlarged sella turcica was the result of the long continued pressure of the abnormally large cisterna chiasmatis.

The gross appearance of the tumor at once suggested the typical dural endothelioma which we see so frequently arising from the dura and pushing the brain before it. The difference was only in size. Whereas the optic nerve tumors were tiny structures, the dural endotheliomata of the brain are frequently as large as

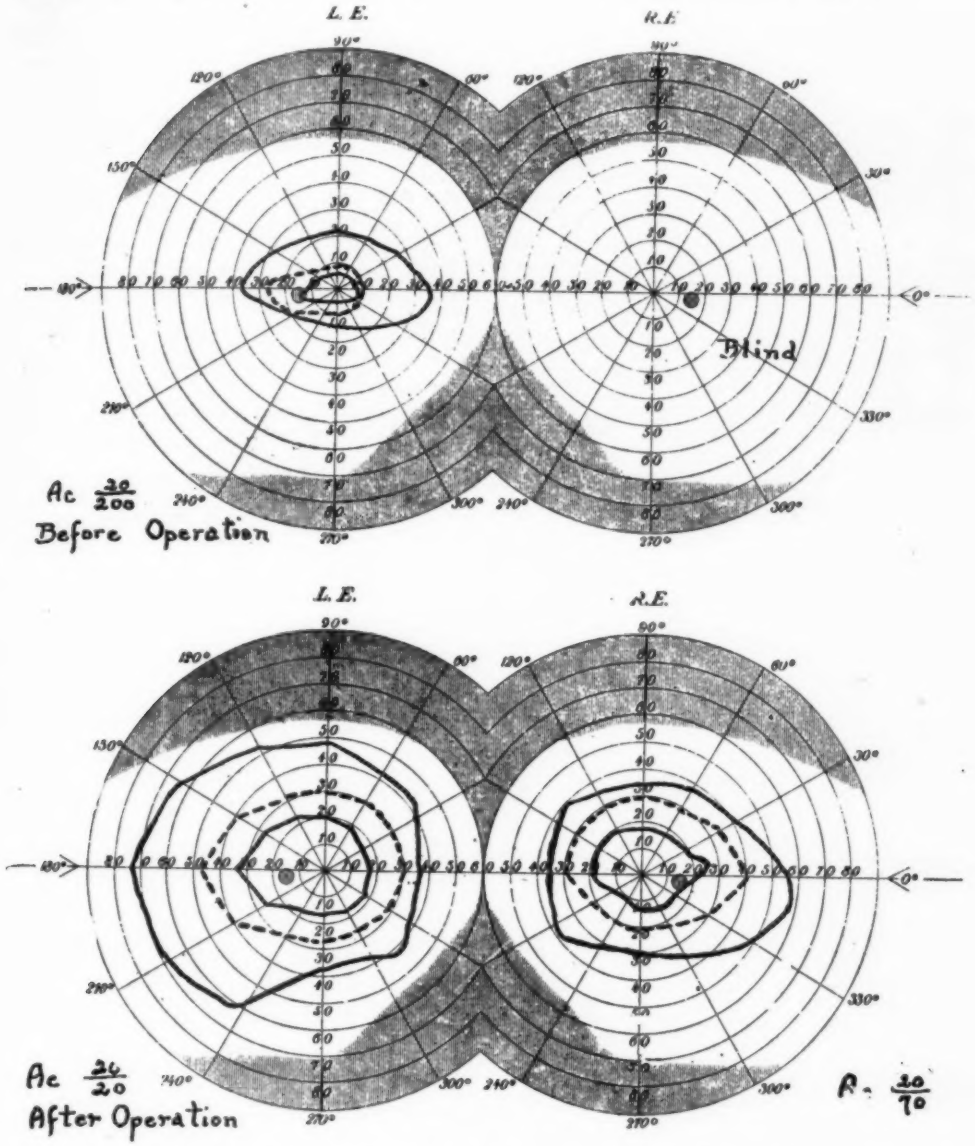

Fig. 8.—Visual fields of patient shown in Fig. 7 before and after operation. The preoperative visual field was taken two months before operation. At the time of the operation this remaining vision was lost and patient was then blind in both eyes.

one's fist. Histologically, the tumors from both the right and left nerve were identical and were exactly like the dural endotheliomata of the brain, with the additional features of a psammoma. (Fig. 11.) The body of the tumors was made up of fibrous tissue, arranged in whorls, strands and columns. (Fig. 10.) The fibrous tissue could

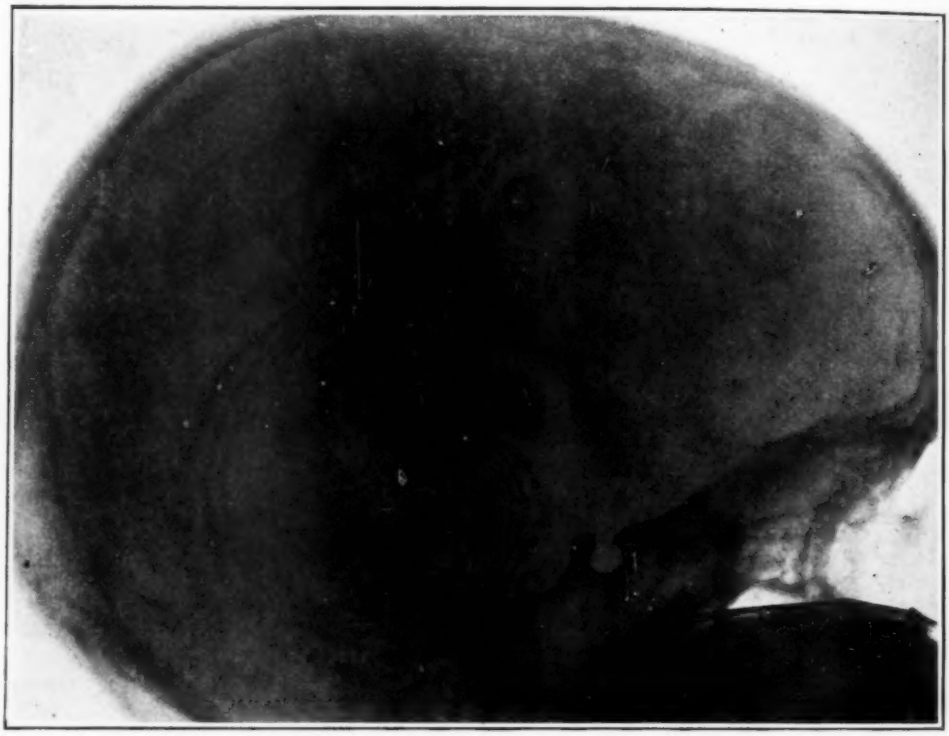

Fig. 9.—X-ray to show normal sized sella in Case 2.

easily be mistaken for that of a spindle celled sarcoma. In the connective tissue were nests of the characteristic whorl like onion bodies—deeply red staining hyalin, lamellated crescents. (Fig. 11.)

The tumor surrounding the right optic nerve was totally removed. It was necessary to strip the dura from the optic nerve, it being an integral part of the tumor. The tumor had, also, grown forward into the orbit for a distance of 1 1/2 cm. The removal of this part of the growth necessitated the resection of part of the superior wall of the orbit. (Fig. 5.) The left nerve being so far distant from the operative field (a right sided craniotomy having been performed), only a partial removal of its tumor was possible. This removal, nevertheless, restored the vision of the left eye to 20/200 within two weeks after the operation, color fields returning also and being practically normal. Vision in the right eye, however, has not yet improved. The vision in this eye is known to have been totally absent for over 3 years, and this probably was of much longer duration. Whether vision so long lost can return, I am not prepared to say.

Case 2. The second patient was a normal appearing boy of 8 years (Fig. 7), referred by Dr. E. Terry Smith of Hartford, Conn. One year before admission to the hospital, his teacher noticed that his vision was not good. An immediate examination by an oculist disclosed almost complete blindness of the right eye and a marked diminution in the vision of the left. According to his father, there have been vascillations in the vision, but on the whole it has decreased, tho very slowly. When a

year old, a fork's prong is said to have pierced the right eyeball. The history about this point is rather vague, and it was not certain whether the eye had been blind since that time. His father thinks, however, his eyes had been examined subsequent to that accident and nothing found abnormal. On admission to the Johns Hopkins Hospital, there was only slight vision in the right eye and a little more in the left. No definite evidence of hemianopsia. Color is not perceived in the right and only slightly in the left eye. Visual acuity is 20/200 in left eye; fingers are seen at a distance of two inches with the right eye (Fig. 8). Dr. Smith first saw this patient 4 months ago and at that time the vision in the left eye was 20/100, and practically nil in the right. Aside from a slight pallor of both optic discs, the neurologic examinations were entirely negative. The paranasal sinuses had been repeatedly examined with entirely negative results. The skiagram of the head showed nothing abnormal (Fig. 9). The cerebrospinal fluid was normal and the Wassermann reaction was negative both from the blood and cerebrospinal fluid. He had never had headache or vomiting. There were no extraocular palsies, and he has never had diplopia. In other words, aside from a very slowly developing blindness, there was no subjective or objective

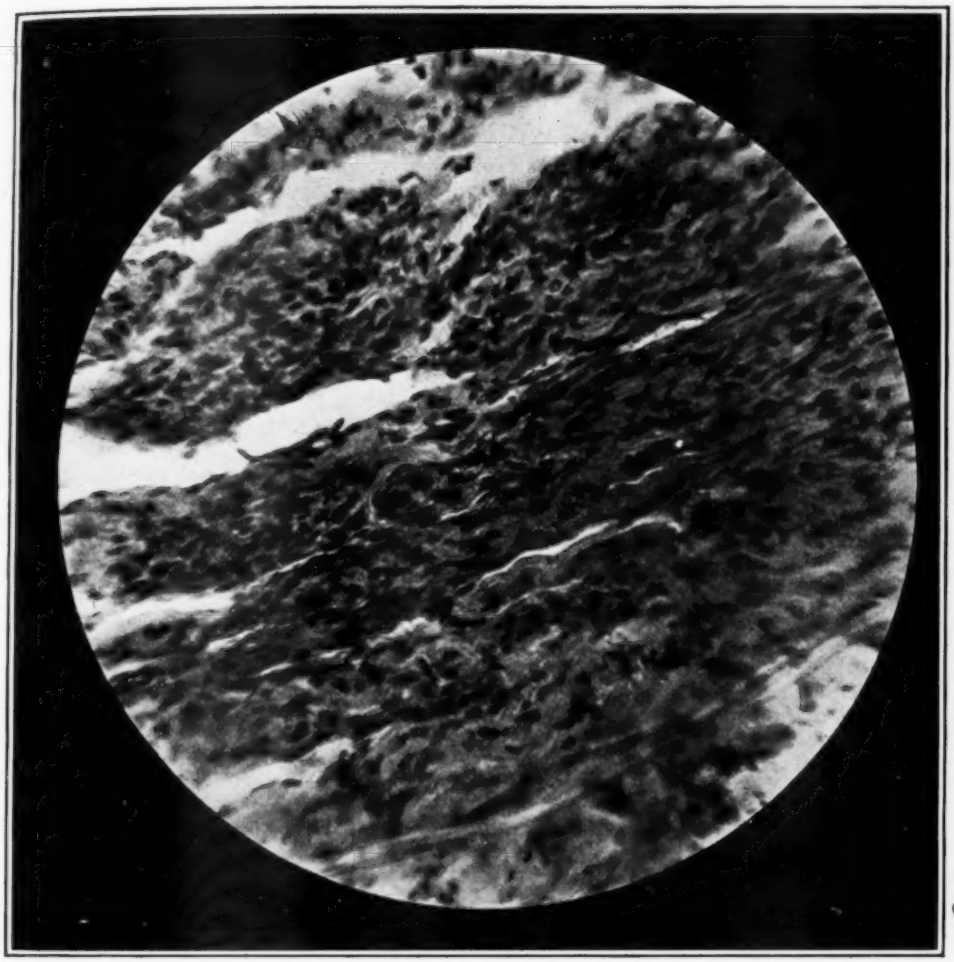

Fig. 10.—Photomicrograph of same tumor showing its fibrous character. In this section there are no psammoma bodies.

evidence of an intracranial affection. In view of the negative findings and solely by exclusion, I was inclined to assume the diagnosis of optic neuritis of some indeterminable toxic origin. The striking resemblance to the preceding case, however, forced the possible diagnosis of a prechiasmal tumor and, bearing this in mind, the patient was advised to return home for further observation of his vision. During the succeeding two months, three examinations were made by Dr. Smith and in each there was a decided reduction in vision over the preceding test. In the right eye, he had become totally blind; and with the left he could only distinguish a bright light; he could no longer count fingers. He then returned for an exploration of the chiasmal region by an intracranial operation.

A right craniotomy extending well forward over the frontal region was performed. The right optic nerve was normal as far as one could judge. There was a small circumscribed tumor about the size of a cherry beneath the *left* optic nerve, and by pushing it upward causing the nerve to arch sharply. (Fig. 12.) A thin band of fibrous tissue over the optic foramen and the anterior clinoid process held the optic nerve tightly against the tumor and produced a distinct constriction of the nerve. (Fig. 13B.) A marked pallor of this nerve gave a striking contrast to the normally pink

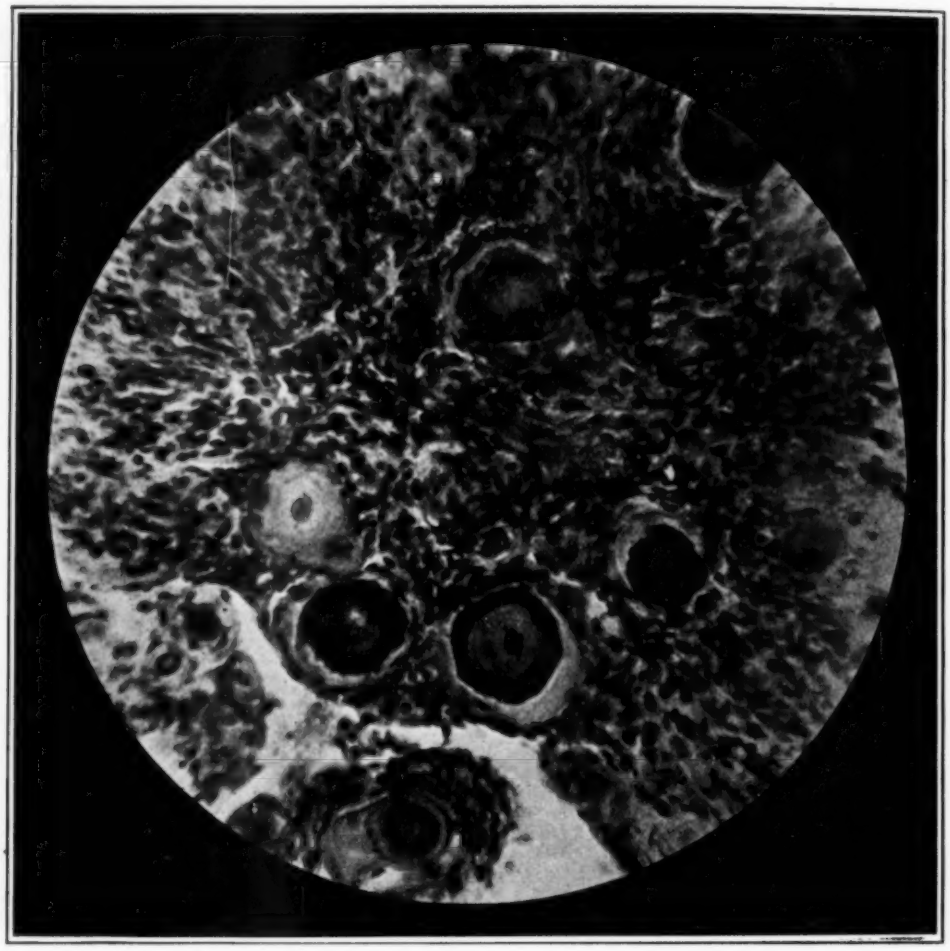

Fig. 11.—Photomicrograph of tumor showing psammoma bodies.

color of the right side. This band being incised, the nerve was at once released from the clutches of the tumor. The operative exposure had been made from the right side of the head because of the prior and greater visual loss on the right; the tumor was, therefore, too far distant to permit of its removal with safety. Fearing bleeding, because of its apparent vascularity and inaccessible position, I did not even dare remove a piece for diagnosis. The exact nature of the tumor could, therefore, not be determined, and as the major part of the tumor was hidden from view by the optic nerve, its point of origin could not be accurately determined. I feel, however, that it probably arose from the dural sheath at the optic foramen. The tumor did not seem to enter the optic foramen; it was not a small extension of a larger growth; the exposure at operation was adequate to determine this point with certainty; it seemed most likely an endothelioma. The incision of the band produced all the relief which could be obtained with safety; subsequently the tumor can be easily removed by an operation directed from the left side of the head.

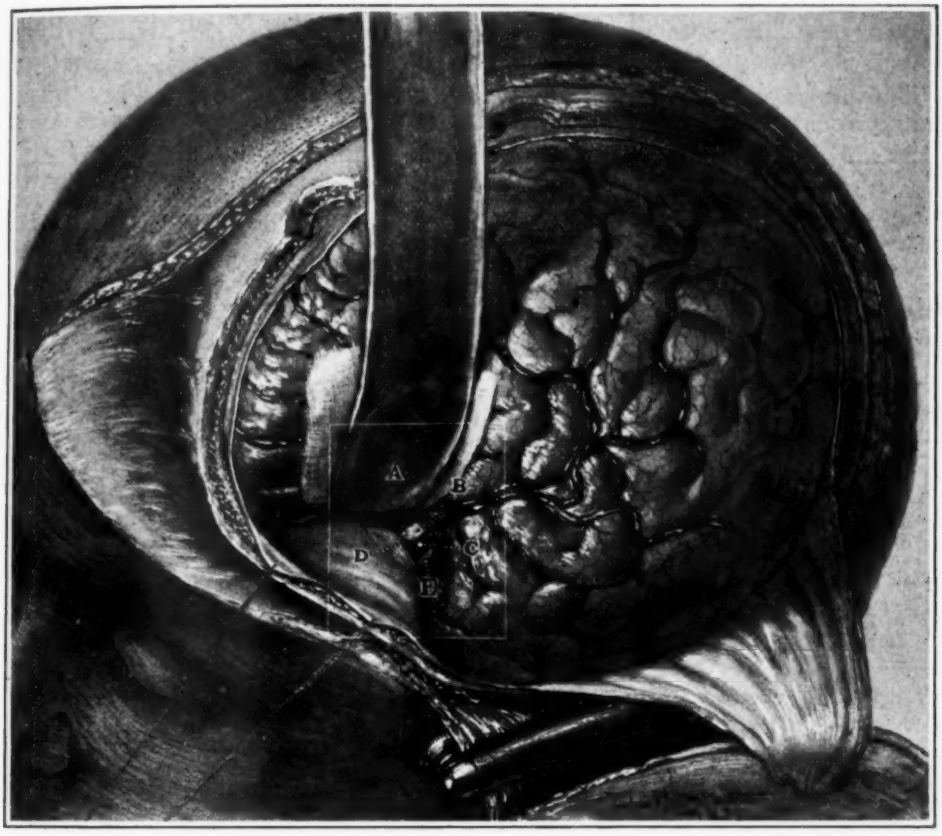

Fig. 12.—To show the operative exposure of the tumor in patient shown in Fig. 7. A Spatula retracing the frontal lobe. B. Left optic nerve between the optic foramen and optic chiasm. C. Tumor pressing upward and held by the scar (D), which is over the lesser wing of the sphenoid. B. Left carotid artery.

An amazing restoration of vision (see charts) followed the simple division of the binding band over the left nerve (Fig. 8). The visual loss was, therefore, due to a physiologic block of the nerve; apparently there was little if any destruction. I have yet been unable to understand the loss of vision in the right eye since it was not directly affected by the tumor; equally puzzling is the rapid restoration of vision in this eye. It can, of course, be explained only on a sympathetic basis. The visual acuity within two weeks

after the operation had returned to 20/20 in the left and 20/70 in the right. Almost a normal field of vision including color returned in each eye (Fig. 8). A letter received from his father as this paper is being written (six months after the operation) says his vision continues to improve and he is now attending school.

PATHOLOGIC ASPECTS OF PRECHIASMAL TUMORS.

The tumors which are here reported are representative of a well known though not extensive group of endotheliomata or psammomata. They arise from the dural sheath of the optic nerve and heretofore have been described only for the intraorbital part of the nerve. This particular tumor is unusual in that it is bilateral, is perfectly symmetric and so small after at least six and probably many more years' growth. These cases are, so far as I can determine, the only reported instances of intracranial optic nerve tumors which have been diagnosed clinically and found at operation.* There is no reason to believe that intracranial optic nerve tumors should be different from those of the intraorbital part, except that within the skull the optic nerve is devoid of the dural sheath. All *intracranial* tumors of the optic nerve arising from the dura must therefore arise at the optic foramen, where the dura is reflected, and secondarily project into the cranial cavity. The three tumors here described arose at just that point.

Intraorbital optic nerve tumors have been thoroly collected and reported from time to time. Willemer[2] (1879) collected from the literature probably the first series of 27 cases; Jocqs[3] (1887) found 62 cases; Braunschweig[4] (1893) 94 cases; Finlay[5] (1895) 117; Byers[6] (1901) 118 and Hudson[7] (1912) 154 cases which together with an appended list of 28 cases brought the total to 182. There is little to be added to the excellent contributions of Byers and of Hudson. In each the literature is well covered and all the available histologic data, usually obscured in the chaos of a changing pathology, has been carefully scrutinized in order to bring them into a harmonious grouping. While these tumors may assume various histologic appearances, they may all be run down to the usual con-

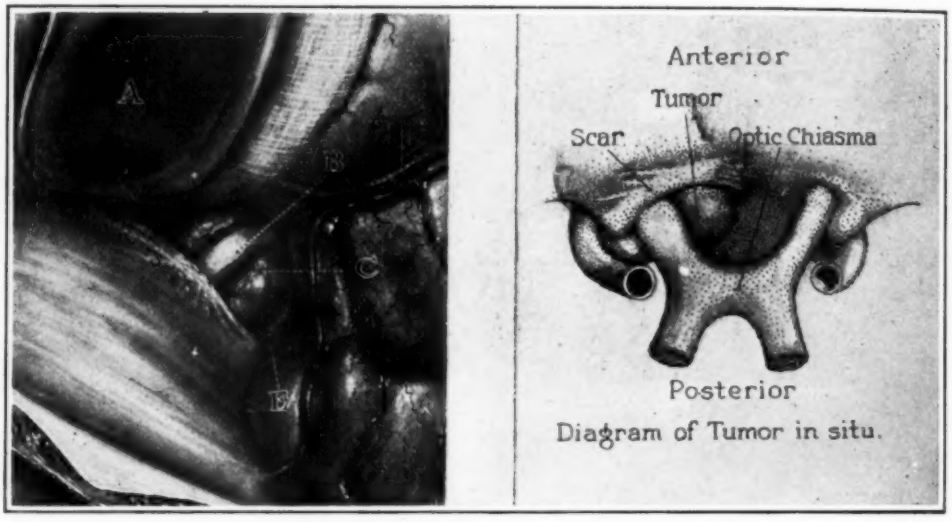

Fig. 13.—A Magnification of Fig. 12. Diagram to show relation of this tumor when looking from above.

*Since this paper was sent to the press, I have found a very similar case recorded from a necropsy by Schott (Archiv. f. Opth., 1877, vi, 276). A small circumscribed tumor (5x5 m. m.) was found on each optic nerve in the region of the optic foramen. Each tumor was a psammoma, containing many onion like formations. Their presence was not suspected during life. The patient was fifty-five years old and blind.

nective tissue derivatives with protean expression. Hudson has added an abstract of each of his 182 cases. Byers has considered principally the intradural tumors of which there are 102, and has appended 16 cases of extradural tumor. Parsons[8] (1902) collected 18 cases of dural (extradural) tumor. Hudson has assembled the cases into three groups: (1) those arising from the connective tissue of the nerve

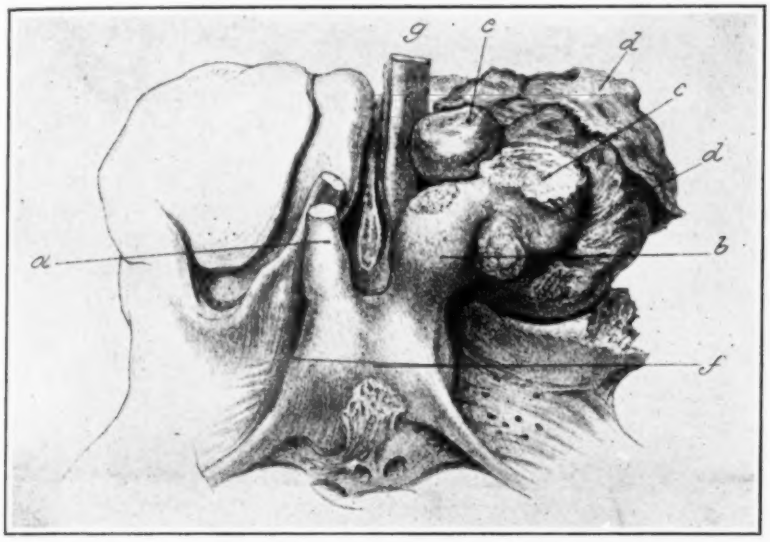

Fig. 14.—(*a*) Right optic nerve not thickened. (*b*) Enormous thickening of left optic nerve. (*c*) Surface of incision of same in the region of the enlarged optic foramen. (*d*) Large tumor growing out of left optic nerve. (*e*) Cystic protuberance of the same. (*f*) Greatly enlarged chiasm. (*g*) Displaced olfactory nerve of the left side.

Photograph from Willemer. This is one of the earliest recorded cases to show the extension of the orbital tumor into the cranial cavity and the subsequent involvement not only of the opposite nerve but of the optic chiasm as well. It may be taken as representative of the great group of intraorbital optic nerve tumors which are not localized to the orbit, but have their intracranial involvement by extension through the optic foramen. The character and extent of the intracranial involvement varies, of course, according to the type of the tumor.

—intradural—(he uses the term gliomatosis) (118 cases); (2) those due to fibromatosis of the nerve sheath (6 cases); and (3) endothelial tumors arising from the dura and analogous to endothelial tumors of the membranes of the brain; many of these tumors contain the psammoma bodies. The still simpler classification of Byers—intradural and dural tumors—subordinates all the histologic features of these growths.

From the standpoint of practical treatment, much can be learned from the clinical tables of the cases collected by Byers and Hudson, and I have drawn upon them freely. Probably the most important feature of all is the high percentage of intraorbital tumors which have also an intracranial extension of the growth. Apparently this applies about equally to the intradural and dural tumors. In most of the cases there is direct continuity between the intraorbital and intracranial parts of the tumor. The narrow optic foramen, which is usually but not necessarily enlarged from the effects of the tumor, gives the growth an irregular dumbbell appearance. In some cases, the intraorbital part of the tumor may be larger than the intracranial and the reverse may be true. In a few instances, there have been multiple discrete tumors involving each nerve or both nerves, and occasionally even the optic chiasm is included. In a few instances the tumor has grown backward along the base of the brain as far as the pons and medulla. At other times, it has grown upward into the brain and may even have pierced the 3rd or one of the lateral ventricles. The intracranial involvement in intraorbital optic nerve tumors was emphasized by both Byers and Hudson, but at the time of their publications there seemed

little that could be done to cure a patient when the tumor had passed thru the optic foramen into the interior of the skull.

The exact proportion of intraorbital tumors which grew into the cranial chamber can, of course, not be estimated with any degree of accuracy from the cases collected from the literature. The clinical diagnosis of brain tumors has been too unsatisfactory to give any accurate data, for tumors of the brain may grow to a tremendous size before they will be suspected. Many of these tumors have developed very slowly. A case reported by Byers, died of the intracranial growth 10 years after the orbital tumor had been removed (Fig. 15), and one by Pagenstecher and Steffan[9] died 25 years after the removal of the tumor of the orbit. Frequently, the intracranial extension of the tumor has been known by the fact that tumor tissue has been cut thru when the orbital tumor has been removed, making of course an incomplete removal of the neoplasm; but this operative report has often been lacking, and often pathognomonic symptoms of the late phases of the intracranial growth or the post-mortem proof has given the inadequate information at hand. From 102 cases of intradural tumor in Byers' series, at least 23 gave indisputable evidence of an intracranial involvement; and from Hudson's series of 182 cases, 17 additional cases have been found, i. e., cases which have not been included in Byers' series. From 191 cases of both series (cases not duplicated) there are, therefore, 40 cases (21%) in which the intracranial involvement is certain. The actual percentage is, of course, very much higher, for the ultimate results of most cases cannot be obtained, either because the patients cannot be traced or because necropsies have not been obtained. On the other hand, Byers states that from his 112 cases

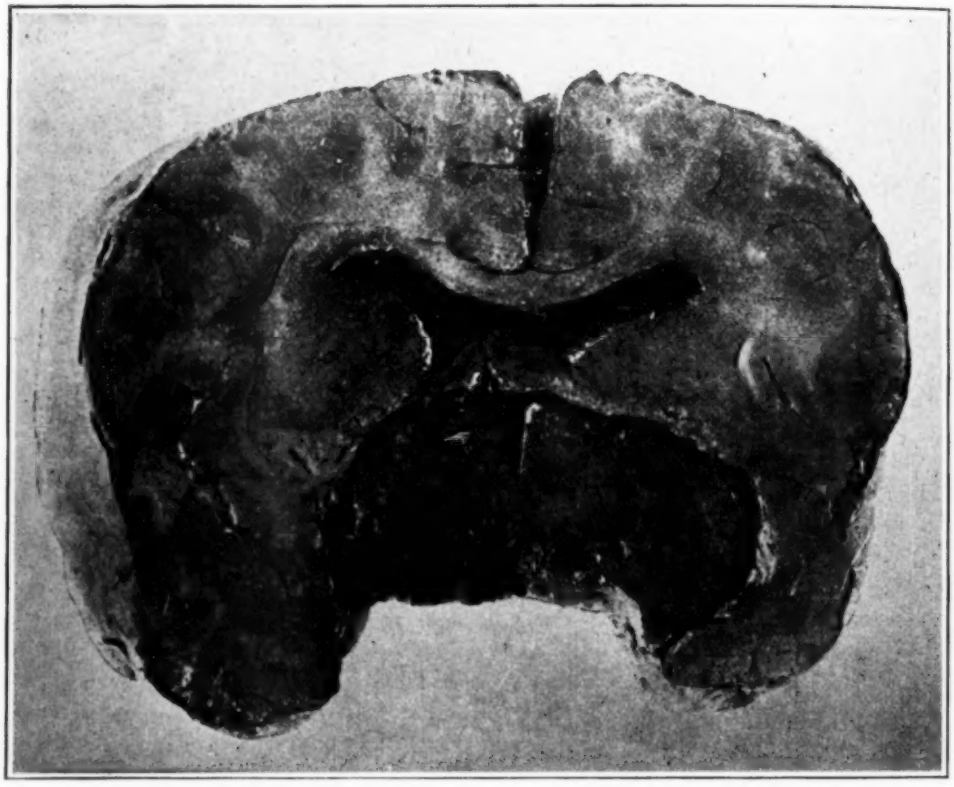

Fig. 15.—Photograph from the article of Byers, showing a large intracranial growth as part of an intraorbital tumor. This post-mortem was made ten years after the first operation in which the orbital tumor was removed.

"only 8 are known positively by record to have continued in a good state of health beyond five years."

An analysis of Hudson's tables, from the viewpoint of the operative findings, strikingly shows the great proportion of cases in which orbital tumors are complicated by an intracranial extension of the growth. The reports from the operators who have removed the orbital tumor show, that in at least 51 out of 118 intradural tumors the tumor removal was probably incomplete (43%); and from 34 dural tumors, 13 (or 39%) were probably incompletely removed. 64 of the total number of 152 cases were therefore only partially removed (42%). As many cases which were not completely removed would never be so reported, the actual percentage of orbital tumors having intracranial extension would be much higher.

Even more astounding and impressive is the analysis of all the reported necropsies in the entire series of cases reported by Byers and by Hudson. Of 23 postmortem examinations which were obtained in cases of intraorbital optic nerve tumors, 21 showed an intracranial growth and in only one instance did the cranial cavity contain no tumor. Fourteen (14) of these autopsies were obtained on patients who died of meningitis within a few days after the orbital tumor had been removed; the intracranial tumor, therefore, was present when the orbital growth was treated; three (3) necropsies were obtained when the patient subsequently died of intracranial pressure; and in five (5) necropsies the tumors were found in patients who died of an intercurrent disease; in two of these, the tumor of the optic nerves was an unexpected finding, tho the patients had been blind.

Apparently both dural and intradural tumors of the optic nerve give intracranial involvement in about equal proportion. From 118 cases of intradural tumors in Hudson's list, 20 were definitely known to have had intracranial tumors (17%), and 7 of 34 dural tumors had tumors in the cranial cavity (20%). The actual percentage in each variety is, of course, very much higher.

The most striking clinical difference between the intradural and dural tumors within the orbit, and doubtless the same is true of those within the cranium, is the average age of onset and the rate of the tumor's growth. Again we refer to the excellent tables of Byers and Hudson, both of which are so complete in every detail. Among the intradural tumors, 62% develop the symptoms of onset in the first decade of life and 90% before the twentieth year. The dural tumors, however, are distributed fairly evenly according to decades, slightly more than half being accounted for after the 30th year of life. The dural tumors on the whole grow very much more slowly than the intradural tumors, tho exceptions to this rule occur in both varieties of tumor.

THE DIAGNOSIS OF PRECHIASMAL TUMORS.

While *intraorbital* tumors of the optic nerve are early betrayed by exophthalmos, the interposed optic foramen precludes this pathognomonic clinical information in *prechiasmal* optic nerve tumors, at least until the orbit has been secondarily invaded. The pure prechiasmal tumors, such as those entered in this paper, that is tumors affecting only the intracranial part of the optic nerve, will probably give only a progressive loss of vision in one or both eyes. In the early stages of the tumor's growth, the mass is too small to produce any signs of intracranial pressure, and when these do appear, it can be fairly certain that the tumor has become very large and will almost certainly have completely blinded the patient. In each of these cases, there has been a *primary* optic atrophy, with a pale bluish white glistening disc and no changes in the size or shape of the veins or arteries in the fundus. In many of the orbital tumors, swelling of the disc (optic neuritis) has been reported. The cause of this swelling is not exactly clear, but it has been reported so frequently that it must be regarded as authentic. Whether a similar ophthalmologic picture could be obtained in prechiasmal tumors, must be left open. However, in a large

series of intracranial tumors producing a primary optic atrophy from direct pressure on the visual tracts, I have never seen a choked disc until the tumor had grown large enough to have produced marked intracranial pressure. In fact, the ophthalmologic examination is often sufficient evidence to make the diagnosis of a brain tumor compressing the optic nerves directly. One must, of course, think of the probability of intraorbital pressure producing a choked disc just as does intracranial pressure. Both the orbit and cranium are closed chambers with inadequate vent for any unusual or rapidly increased pressure.

The skiagram of the head should show no abnormality in the earlier stages of growth of these tumors; there should be no discernible change in the anterior or posterior clinoid processes. There may be changes in the visual fields such as an atypical nasal or temporal hemianopsia on the affected side; this would not be unexpected, but there is no definite evidence of it in the scant examinations afforded by these cases. The differential diagnosis between some form of optic neuritis and a prechiasmal tumor lies principally in the character and rapidity of the visual loss and the character of the eye grounds. A typical optic neuritis gives a more rapid, even at times fulminating, history of visual loss, and is usually accompanied by marked changes in the eyegrounds (neuroretinitis). There are the added but variable manifestations of optic neuritis—central scotoma and enlarged blind spot. Prechiasmal tumors will produce a very gradually progressive loss of vision, the time depending, of course, on the character of the tumor and (this may not be absolute) the fundus should show the characteristics of a primary optic atrophy. There has been nothing in the history of these two cases to suggest a central scotoma. There are, of course, instances of so-called toxic neuritis, in which a known or possibly even an unknown toxin will produce blindness, and the disc will not be unlike that of the primary optic atrophy due to pressure of a tumor on the nerve. There is frequently a central scotoma or enlargement of the blind spot in these forms and also the affection is apt to be bilateral. Unless one has a very definite history of a specific toxin, the diagnosis of toxic neuritis must be one of last resort, and one solely of exclusion of all other possible factors. Intracranial tumors other than those which are of primary origin in the optic nerve, can give a similar clinical picture, and when small and implicating the optic nerve directly, there is no way of making a differential diagnosis. The indicated therapeutic measures, however, would be identical, so that this refinement of diagnosis is not essential. By far the most frequent tumor in this region is the pituitary tumor, which typically, but by no means always, produces a hemianopsia of the bitemporal type; it moreover nearly always shows in the skiagram the characteristic destruction of the sella turcica. There are extremely few pituitary tumors which have been diagnosed without one or the other and usually both of these two objective findings: (1) destruction of the landmarks of the sella turcica, (2) hemianopsia, usually bitemporal, occasionally homonymous.

The most difficult diagnosis to make or to exclude is a second intracranial lesion when an orbital tumor has been removed and apparently does not pass thru the optic foramen. The signs which such a tumor should give have already been given by the intraorbital tumor and, therefore, cannot be considered. The diagnosis of the intracranial extension of these tumors must then await one of three objective signs: (1) extension of the visual defect either to the chiasm or the opposite optic nerve, (2) roentgenologic evidence of destruction of the landmarks in the region (principally the sella turcica), (3) the advent of signs of intracranial pressure.

OPERATIVE TREATMENT OF OPTIC NERVE TUMORS.

In considering the treatment of prechiasmal tumors, I of course include all tumors of the optic nerve in the prechiasmal region, whether primary in the orbit or cranium; and because of the intimate relationship between the orbital and intracranial tumors, it

is necessary to consider all optic nerve tumors in a general way. Until now, the treatment of orbital tumors has been restricted to the removal of the intraorbital tumor. The future of the patient has then been left to chance. And we have seen from the ultimate results, inadequate as they are, that a very high percentage of these patients die of an intracranial tumor. One cannot do better than quote the well stated conclusion of Byers in regard to this aspect of intraorbital optic nerve tumors: "The danger is not from recurrence in the strict sense of the term, but from the continued development of the intracranial portion of the tumor which it is impossible to remove at the time of the operation." This statement was made 20 years ago. Only now has surgery developed to meet this condition.

There are, therefore, two problems to meet in the treatment of all optic nerve tumors, whether intraorbital or intracranial. First and most important, to save the life of the individual and second to save the vision which remains and, if possible, restore that which is gone. I shall merely mention here and shortly publish elsewhere an operative procedure by which both of these objects can be attained. It is not to be inferred that all cases of optic nerve tumor can be cured. Much depends upon the stage at which the diagnosis is made and also upon the character of the tumor. If the intracranial tumor is diagnosed in the late stages there is little point in any operative procedure; the tumor would be too large and would have grown too far back along the base of the brain. Again, in very young children with a rapidly growing tumor, doubtless sarcoma, probably nothing could be done. But in the vast majority of cases, the entire intracranial tumor could be removed and with little danger to life. Fortunately, the optic nerve is more or less suspended in the cranial chamber so that its resection, if necessary, would not be difficult and if a tumor is appended to the nerve its dissection from the nerve would be comparatively simple. The operative procedure consists in turning down a large bone flap, well forward, so that the exposure of the optic tracts is not impeded by lack of room. The procedure was originally intended solely for the intracranial part of the tumor, but in one case the growth extended into the orbital cavity and the roof of the orbit was easily removed, and the intraorbital portion of the tumor enucleated at the same time. The roof of the orbit can then be replaced as in Krönlein's operation. The intracranial operation is advocated for all tumors in which an intracranial optic nerve growth is known to be present. I am not yet prepared to say how far this procedure should be adopted in intraorbital tumors of the optic nerve. It must depend upon a more careful report of the pathology of optic nerve tumors, i. e., exactly what proportion of these tumors have intracranial extension of the growth. If it is found from autopsies and reliable clinical data that most orbital tumors enter the cranium, then this intracranial operation (which combines the intraorbital also) will be found the safest procedure in the beginning, rather than to await the verdict of the operator who has done a local removal of the orbital tumor. In safe hands, the operation itself is practically without danger; it is the removal of large growths which adds the danger.

The reports in the papers of Byers, Hudson and all other authors, of the terrific mortality from meningitis following the removal of intraorbital tumors, reflects the bad treatment of these tumors in the past. There is now, of course, little excuse for any procedure which will permit meningitis. No operation should be performed thru a field which cannot be sterilized and protected. For this reason, operations thru the palpebral fissure and conjunctiva cannot be too strongly condemned. A cerebrospinal fistula results when the optic nerve is severed and it is then almost impossible to prevent meningitis. Krönlein's operation seems the best and safest of the local procedures; it gives the best exposure, and the operator can work thru an aseptic field.

When a local operation has been performed for the orbital tumor and it is found that its complete removal is im-

possible, the intracranial operation must then be done, for unless the tumor can be completely removed, total blindness and death are inevitable. Whatever operative procedure for an intraorbital tumor we may consider best and safest at the onset, this must be adequate to assure the patient that an intracranial extension of the growth does not exist, for when following the interval after the operation the intracranial growth later becomes evident from symptoms of intracranial pressure, the chances of life are gone; the tumor is then too large. As is true in all other intracranial tumors, an early diagnosis simplifies the operative procedure, reduces its dangers and affords the patient the best chance of life and preservation of function.

SUMMARY AND CONCLUSIONS.

1. Two cases of tumors of the intracranial part of the optic nerve are reported.

2. In one case there were two bilateral, symmetric tumors at the optic foramen. Each of these tumors was a psammoma, i. e., a dural tumor, usually considered a dural endothelioma. In the second case, there was a single tumor on the left optic nerve at the optic foramen. In both cases there was bilateral loss of vision.

3. The symmetric tumors entered the orbit thru the optic foramen, the other tumor was strictly intracranial.

4. One was diagnosed clinically; the other was suspected after an earlier diagnosis of optic neuritis; both were found at operation.

5. From the case with the bilateral tumors, all of one tumor and part of the other was removed. The vision was greatly improved as a result.

6. In the second case, the tumor could not be removed because it was under the optic nerve on the side opposite the operative approach. A band of adhesions bound the tumor to the anterior clinoid process, and its incision liberated the nerve from the clutches of the tumor and complete restoration of vision resulted.

7. A very high proportion of intraorbital optic nerve tumors extend into the cranial chamber. Local operations on the orbital part of the tumors in these cases are, therefore, not only futile but give the patient a false sense of security until it is too late.

8. The only justifiable local treatment of intraorbital tumors is one which at once assures the patient that an intracranial extension either does or does not exist.

9. If either a primary intracranial tumor of the optic nerve or a secondary intracranial extension of an intraorbital tumor is present, only an intracranial operation which aims at the removal of the tumor, offers the patient any chance of the preservation of life or vision.

10. An operation is proposed, the object of which is to remove the intracranial or the combined intracranial and intraorbital tumors when both are present.

11. The differential diagnosis of prechiasmal intracranial tumors from other lesions is considered.

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TARGET PRACTICE WITH HERING'S DOUBLE EYE.

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PARIS, FRANCE.

A champion shot with the revolver was found to have slight anisometropia and to use both eyes in sighting, one focussing on the sight and the other on the target. Correction of the difference impaired his aim and reversal of it still more so. The writer experimented himself and with other champion shots and finds, that while binocular aim is impossible for the isometropic, it may be practiced by those who have the right anisometropia. This is easier with the revolver than with the rifle. (Translated by Dr. Oscar Raeder of the American Hospital, Paris.)

Some time ago I had the opportunity of making an interesting observation on the subject of Binocular Vision; it was presented by me to the Ophthalmic Society of Paris (February, 1920), and provoked the idea of several experiments, the details of which I shall now describe.

The patient was a captain of the French army, 48 years of age, champion shot with the revolver, who consulted me because he had experienced difficulty in aiming for some time past.

On examination: O.D. 170° —1 ⌒ —0.50. V. = 1.25. O.S. 170° —1 ⌒ +0.25. V. = 1.25.

Before making any correction, I asked him: "With which eye do you aim?" "With both," he answered. "You keep both eyes open in aiming, a common practice, but with which eye do you sight?" "With both; I watch the bead with the right eye, and the target with the left."

Not convinced of his statement I corrected both eyes for distance. The patient, taking a revolver out of his pocket, drew a bead, and at once declared he could not aim with these lenses. Following his tack, I corrected the left eye for distance, and the right I adjusted with a lens to focus on the bead. The captain then made another trial and stated he could now sight perfectly.

It must be admitted that the anisometropia of this individual had permitted the existence of some independence between the two retinae, if I may so say, but had not interfered with cerebral binocular vision. This man truly had a double eye, according to theory, but consisting of two elements not identical.

Until the age of 48 years, the accommodation had remained sufficiently flexible; when the left eye, slightly hypermetropic, made the necessary effort to accommodate for distance, the right eye became still more myopic, so as to focus on the gun.

In correcting the sight it was necessary to maintain the same conditions; the lenses prescribed were: O.S. 170°—1⌒ +0.25. O.D. 170°—1⌒ +0.50.

That amounted in fact to correction of the former for distance, and to give to the latter a myopia of 1 D. The correction proved to be right, for the captain since wrote me as follows: "I cannot tell you how well pleased I was with the results obtained with the glasses prescribed by you. The least I can say is that I have won the world's championship for pistol shooting at 50 meters, wearing the glasses made according to your prescription . . . etc."

This officer, in view of his championship, was put in command of the "Centre d'instruction des Autos-Mitrailleuses." All the young soldiers are taught, he tells me, to aim with both eyes open as he does, and succeed well, it appears, after a short time. As we must suppose that the majority of these men are normally constituted—i.e. isometropic—I have wondered if it was positive that they have all learned to aim in the same fashion as their chief who is abnormal.

I have made several trials at aiming and firing, and I came to the conclusion that it is really possible to keep both eyes open, but that, under ordinary circumstances, only one eye is used in aiming. Similarly many oculists keep both eyes open during ophthalmoscopy, but disregard the image

from one eye. Moreover this fact has been confirmed to me by many experienced marksmen.

Going further I wished to put myself in the position in which this officer had been put by nature. I therefore, by means of a trial frame, adjusted my left eye for the target and the right to the distance of the bead.

My first attempts were made with a small air rifle possessing no accuracy, and with my army revolver. With these two arms I was able to prove that it is much easier to aim with the revolver because, the barrel being shorter, the distance between the notch and the bead was shorter and necessitated no considerable oscillations of accommodation of the aiming eye. Then also the notch is at a greater distance from the eye than in the case of a gun; and finally the revolver is held straight in front, which prevents all prism effects which are possible when the head is held obliquely in shouldering the rifle.

Here are the measurements found for the revolver: Distance from eye to notch (hind sight), 63 cm., accommodation = 1.6 diopters. Distance from eye to bead (front sight), 77 cm., accommodation = 1.3 diopters.

The difference in accommodation of 1/3 of a diopter should be negligible in practice, for, with a little training, convergence and accommodation can be made to dissociate more than that.

For my small air rifle the distances are as follows:

From eye to notch: 27 cm. (A = 3.7.) From head to bead: 60 cm. (A =1.66.) (See Fig. 1.)

The variation of accommodation is much greater, and the effect on convergence of course also.

The test of the accuracy of the aim, is, of course, the shot. The results of my first experiments were mediocre; but, as I have said, I had to work with two arms, one of which was not accurate and the other equipped with a very rigid trigger; moreover I was using in the revolver not fully charged cartridges, another reason to render the firing altogether unreliable.

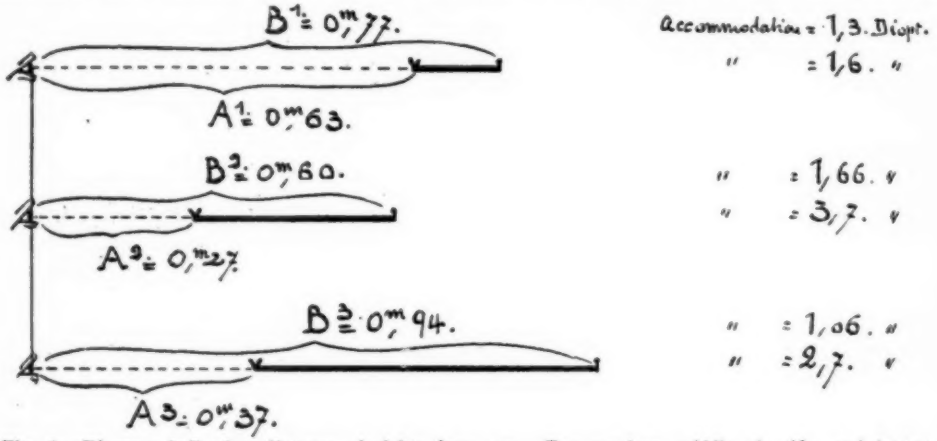

Fig. 1.—Diagram indicating distance of sights from eye. Top revolver, middle air rifle, and bottom, rifle of highest accuracy.

However I was able to establish one point, and that is this: I had undertaken two series of aiming experiments; in the first I left the weapon unchanged, for the second I fitted the weapon with a card perforated by an opening corresponding to the diameter of the barrel, and placed in front of the bead, or front sight, so as to obscure the target entirely from the right eye.

Now the result was much more accurate in the former case. I believe that in spite of the correction of the right eye, I was able to make the blurred image which was formed by the target on this retina coincide with the distinct image of the left eye; in any case there was a certain superpo

sition which prevented too great a deviation.

Thanks to the kindness of my friend Mr. Paul Colas, I was able later to carry on my experiments under the very best conditions.

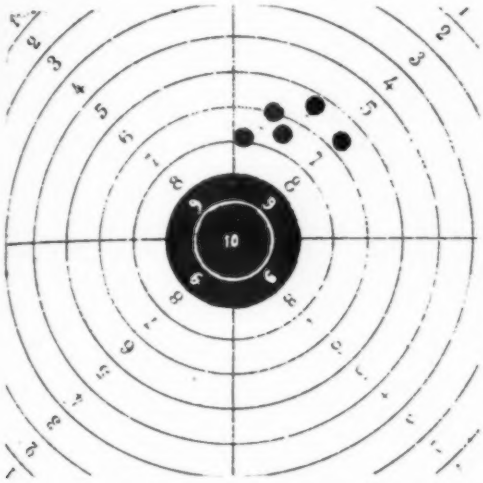

Fig. 2.—Target showing revolver shots sighting with one eye.

At first I thought it desirable to fix a gun in a rack and to control the binocular aim by a monocular aim; but I was advised against this. So we proceeded to real shooting.

We began with some revolver experiments. A good marksman was kind enough to take a first aim, free hand, sighting with but one eye. The weapon was unknown to him, and the trigger, as I have said, much too stiff. The result was, nevertheless, not bad; the five shots being close together. (Fig. 2.) The barrel was then furnished with a shield, so as to obscure the target from the right eye. Both eyes were kept open, but without any optical correction. Immediately the aim became bad; the shots passed well off to the left, to various degrees, one of them missing the target altogether, in spite of the enlargening of the target. (Fig. 3.)

The most conclusive experiments were made under conditions permitting of an aim as steady as possible. The arm was a rifle of highest accuracy, the gunner was seated, his elbows resting on a table, and the barrel resting on a conveniently high pile of folded blankets.

We confined ourselves to the most difficult method of aiming, i.e., with a shield mounted on the barrel, obscuring the target from the right eye.

The measurements of the rifle were as follows:

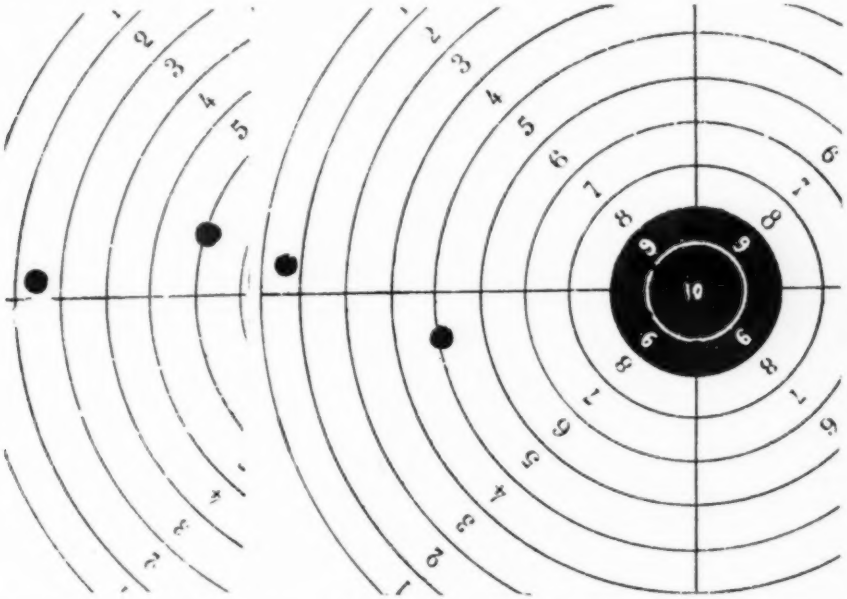

Fig. 3.—Target showing rifle shots with shield hiding it from the right eye, both eyes open. Shots passed to the left, one missing target entirely.

From eye to notch: 37 cm. (A. = 2.7 D.) From eye to bead: 94 cm. (A. = 1.06 D.) (See Fig. 1.)

The marksmen were:

Mr. Paul Colas.* A first class shot, in excellent form. Age 41. O.S. 90° —0.25 + 0.25 V. = 1.75. O.D. 100° —075 + 0.25 V. = 1.75.

Mr. Johnson. Excellent marksman and in good form. Aged 44. O.S., O.D. Emm. V. = 1.25.

Dr. Ed. Huebscher. Formerly classed as a good shot, but who had not practised for over 7 years. Age 25. O.S. Myopia 1.75. V. = 1; O.D. Myopia 2. V. = 1.

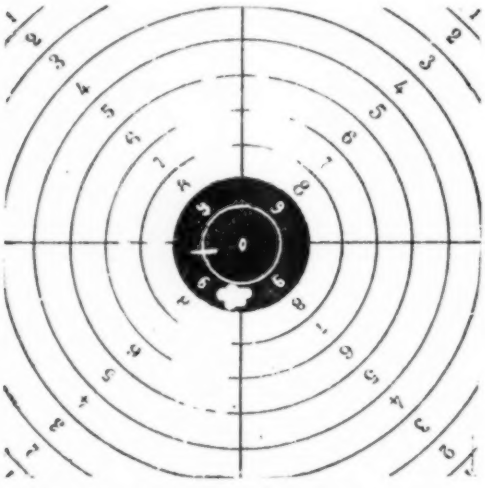

Fig. 4.—Target of Mr. C. shooting rifle under usual conditions.

Dr. Marc Landolt. Out of shooting practice for 18 years. Age 42. O.S. O.D. Hypermetropia 1.25. V. = 1.50.

Mr. C. began by making a trial under the usual conditions. (Fig. 4.) The five shots were so accurate as to make just one large perforation.

Then the gun was furnished with a shield; the marksman was given no optical correction whatever. Mr. C. immediately experienced great difficulty in aiming. Not only did the images corresponding to the two fields of vision not always appear synchronously, but the target would apparently be displaced, more or less suddenly, and for various distances, in the horizontal. The point aimed at was always the center of the target. The shots swerved to the left and spread further and further. (Fig. 5.) Fitted with two different correcting lenses, one for the distance of target (left

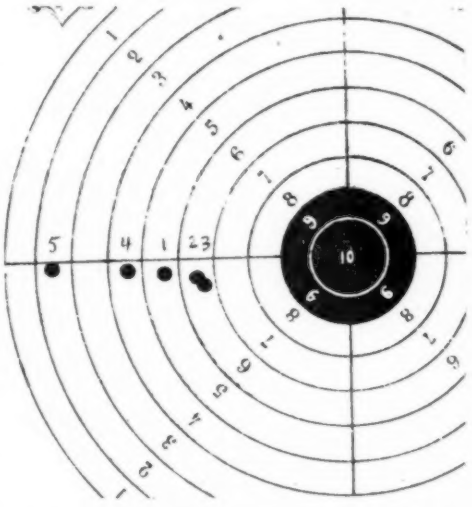

Fig. 5.—Mr. C. with right eye shut off from target. Shots all passed swerved to the left.

eye), the other for the distance of front sight (+1. right eye), Mr. C. found himself entirely embarrassed and gave it up.

Mr. J. then submitted to the experiment. His left eye was left naked; the right corrected, after trials, with a +0.75 which permitted him to read fine printed text at the distance of the bead. The aim of Mr. J. was excellent, considering that the conditions under which he shot were altogether abnormal and new to him. (Fig. 6.)

Dr. Ed. H., on the contrary, corrected only his left eye (—1.75), and kept the right eye—no doubt a bit too my-

*Mr. Paul Colas had been champion shot at 600 meters, at the Olympic games held in Stockholm in 1912, after a very close match with the American, Lt. Osburn. (Champion at Antwerp in 1920.)

Mr. Johnson had been champion of France, and finished second at the 200 meter rifle range in the Olympic games at Antwerp in 1920.

I wish to express my cordial thanks to these gentlemen for their esteemed opinions and valuable cooperation.

opic for the purpose—without correction. His result under the novelty of conditions was also fairly good. (Fig. 7.)

In my turn I made a first trial under ordinary conditions. The result is shown in Fig. 8. The left eye was shut, the right corrected for distance. (The shot below went off without my control, on account of the very soft trigger.)

For the second trial I used the following glasses: O.S. +1.25. O.D. +2.25. As expected the results were less exact. It is to be noted, in particular, that the errors were to the left. (Fig. 9.)

The binocular aiming, under the circumstances cited above, is rendered difficult by two different factors.

When the two eyes are *isometropic*, the target undergoes a series of apparent oscillations, in the horizontal, which do not permit the two images to superimpose each other for a period of time long enough to assure a good

Fig. 6.—Mr. J., left eye naked, right wearing correction.

Fig. 7.—Mr. H., left eye corrected, right without correction.

Fig. 8.—Dr. L., left eye shut, right corrected for distance.

Fig. 9.—Both eyes wearing glasses. Left correction; right plus 1. D. added.

aim. Besides there is certainly a struggle between the two retinae on account of which it is impossible to perceive the two images simultaneously except for very short periods.

In the case of *anisometropic* vision, the first factor is almost entirely eliminated; the lateral deviations are scarcely perceptible. But the struggle between the sensations coming from the two retinae is very pronounced. Sometimes the target is seen alone, then an image of the front sight and back sight floats into the field and finally replaces that of the target. This alternation is not very regular as to time. In my own case, I followed the line of aim with the right eye, then, at the moment of each substitution of images, I could see the center of the target; after 3 or 4 of such substitutions I had simply to fix well on the target and draw the trigger at the precise moment when the bead reappeared.

When we compare our results, we are struck by the following fact: Mr. C., Mr. J. and myself swerved to the left, whereas Dr. H., on the contrary swerved to the right. The deviations were greatest for Mr. C., indisputably the best shot. This is because he aimed binocularly without being anisometropic, i.e., without being corrected simultaneously for distance and for the sighting apparatus. The efforts of accommodation necessary for him to follow the line of aim, without doubt provoked corresponding movements of convergence. These caused the sensation of oscillation and the deviation to the left of the image of the left eye.

The phenomenon is the same, altho very much less marked, in the case of Mr. J. The right eye is corrected with a lens of +0.75 for the front sight, a distance of about one meter (40 inches), but the slight accommodation necessary to focus on the hind sight seems to have been sufficient to cause a leftward deviation of the image of the left eye.

In my own case, being hypermetropic and presbyopic, and besides, a marksman in poor practice, the phenomenon was more manifest. If a shot was carried to the right it is but another proof of the instability of the vision in the horizontal.

Dr. H., as we have stated is, on the contrary, myopic. The left eye had been corrected for distance, the right eye remaining myopic. His 2 D. were more than was needed for proper vision at the distance of the bead, and the marksman made absolutely no effort of accommodation—"he did the contrary" one might be tempted to say—and his shot deviated to the right.

From our experiments one can conclude:

If many marksmen keep both eyes open, they do not see with more than one, and disregard the image of the other.

Binocular aim is impossible if the eyes are isometropic because of the variations of convergence which accompany the more or less rapid changes of accommodation necessitated by the successive focussing on the target, the bead, and the hind sight. These variations in convergence produce an apparent displacement of the target which forestalls all accurate aiming.

Binocular aim is possible with anisometropia, on condition, naturally, that the difference in refraction between the two eyes corresponds as nearly as possible to the difference of the distance between the target and the aiming apparatus. If marksmen finding themselves for the first time under these abnormal conditions arrived, on first trial, at results of as passable an accuracy as shown here, a congenital "anisometrope" must doubtless be able to aim binocularly.

The *anisometropic* aim is considerably more facile when the weapon is not furnished with a fender, when consequently the image of the target is formed on both retinae, even tho the two images are not equally well focussed.

The *anisometropic* aim is perforce more easily taken in the case of the revolver than with a rifle, for, the barrel being shorter, the absolute vari-

ations of accommodation are smaller; in fact so small that they are almost negligible in practice, especially for a congenital anisometrope. These variations are still less important when they are evaluated in relation to the distance from the eye to the hind sight, which is larger for the revolver than for the rifle. The angles of convergence are therefore relatively smaller.

The officer mentioned at the beginning of this article fulfilled to a nicety the conditions required for binocular aiming. The difference between his eyes is 0.75 D. He therefore is an exception, and it is hardly possible that any of the young soldiers he instructed had really learned to aim in the same manner as their master, tho the latter was convinced that they had.

RECURRENT HEMORRHAGES INTO THE RETINA AND VITREOUS OF YOUNG PERSONS.

WILLIAM C. FINNOFF, M.D., Oph.D.

DENVER, COLORADO.

This paper is based on five cases encountered by the writer, the histories of which are here included, and the cases found reported in the literature, 110 in all. It was read before the American Ophthalmological Society in June, 1921, accompanied by elaborate tables of cases apparently due to tuberculosis, syphilis, gastrointestinal trouble, focal infections, menstrual disturbances, and disturbances of blood and circulation, with undetermined causes in 51 cases. The principal conclusions drawn from this study are here given. The detailed tables are published in the Transactions of the American Ophthalmological Society.

The symptom complex of recurring hemorrhages into the retina and vitreous, followed by retinitis proliferans in young persons, has been well understood by ophthalmologists for many years. The predisposition of some young men to spontaneous hemorrhages into the eye was first described by von Graefe[1] in 1854. Modern textbooks refer to this condition, and considerable space is allotted to it in the American Encyclopedia of Ophthalmology.[2] The etiology of this condition, however, has not yet emerged from the realm of speculation.

Forty years ago, Eales[3] accurately described the symptoms and course of recurrent retinal hemorrhages. His cases occurred in males between the ages of fourteen and twenty years. The left eye was first affected. There had been a history of epistaxis and constipation in most of the cases, and the author attributed the condition to a neurosis which affected the digestive and circulatory systems. Eales believed that the disease did not occur in women, and that menstruation acted as a safeguard.

Panas called the condition "Ocular Epistaxis," and noted that in the young the hemorrhage was from the veins, whereas in the old the bleeding was from the arteries. Beaumont[4] and others have reported cases associated with epistaxis.

In 1882 Hutchinson[5] advanced the theory, that some cases of recurrent retinal hemorrhages occurring during adolescence were due to congenital gout. Leber suggested oxaluria as a cause, and Jacqueau[6] reported a case which he thought was due to a phosphaturia and excess of urea. The hemorrhages in this case recurred over a period of sixteen years. Syphilis, both congenital and acquired, has been advanced as an etiologic factor.

Noll,[7] in 1908, was the first to suggest tuberculosis as a cause of recurrent hemorrhages into the retina and vitreous.

In 1909 Kipp[8] described a case of recurrent hemorrhage into the retina and vitreous of both eyes in a young man with tuberculosis of the hip and chronic otitis media. The hemorrhages were followed by retinitis proliferans. A second case, which he had reported before this Society in 1895,[9] occurred in a young man who had a cough and lost weight shortly after the occur-

rence of the retinal hemorrhages, but who later regained perfect health. Kipp suggested that these cases were of a possible tuberculous nature. Axenfeld's[10] article in 1910 called attention to the fact that recurrent retinal and vitreous hemorrhages were often due to tuberculosis, even tho no apparent tuberculous changes had occurred elsewhere in the eye. This author reported 3 cases to support his view. He believed that the lesions were due either to the tubercle bacilli or to the actions of their toxins, and that the individuals suffering from the disease were frequently robust and apparently in good health. Improvement followed the administration of tuberculin in Axenfeld's cases, and he advised its use as a diagnostic and therapeutic measure. Since Axenfeld's observations, Igersheimer,[11] Harms,[12] Jackson,[13] and many others have reported cases due to tuberculosis. (See tables.)

Toxemia has been suggested by Moissonnier[14] as a cause; and recently Zentmayer[15] has called attention to the possibility of derangements of the endocrine organs, especially the adrenals, as a contributing factor.

Hemophilia, disorders of menstruation, indicanuria, excessively high or low blood pressure, the anemias, nephritis, exercise, and other conditions have been mentioned as possible causative factors in the production of recurrent intraocular hemorrhage in the young.

In the past six months there have come under my care three young men with recurrent massive hemorrhages into the retina and vitreous. I have been impressed by the similarity of the symptoms in these and other cases that I have seen. In attempting to determine the basic etiology of the hemorrhages, my interest in this disease was sufficiently aroused to search the literature to see what had been written on this subject.

The following reports are of cases which have come under my care since 1916:

Case 1. A farmer, aged twenty-eight years, had massive recurrent hemorrhages into the retina and vitreous of the right eye, following a periphlebitis of the retinal veins. A focal reaction to tuberculin was obtained. The hemorrhages remained confined to the right eye. Jackson reported this case with other cases of tuberculosis of the retina before this Society in 1919, and I will refer you to the Transactions for the details of this case.

Case 2. W. P. B., aged forty-two years, seen first May 16, 1919. Three years before he had developed pulmonary tuberculosis, and had come to Colorado, where he rapidly regained his health. For three years he had felt well and had not coughed. The vision of the left eye always had been poor, probably from an amblyopia ex anopsia. History otherwise negative. One year prior to consultation, the vision of both eyes had blurred suddenly; it gradually improved, but did not regain its former acuity and floaters have been present ever since. May 12, 1919, the vision became suddenly clouded. There had been no pain or discomfort in the eyes at the time of the blurring or since. When first seen, V.R.E., 0.05; L.E., 0.2. The right vitreous contained small masses of blood; these were more numerous in the lower half. The remainder of the vitreous was uniformly hazy. A hammock shaped subhyaloid hemorrhage, with its convexity downward, was noted, extending from the lower temporal vein to the lower nasal vein. The veins were uniformly distended and tortuous. A perivascular, yellowish exudate, covering one of the terminal branches of the upper temporal vein, was seen. The Wassermann reaction and urine were negative. There was no history or evidence of infection in the tonsils or nasal sinuses; and X-rays and examinations of the teeth and jaws were negative. The systolic blood pressure was 122 mm. of mercury. Upon physical examination, a small cavity was found in the apex of the right lung. It was thought advisable not to use tuberculin in this case, because of the danger of lighting up a latent tuber-

culous focus in the lung, so the patient was sent to a sanatorium for general hygienic treatment. In a letter from the patient, received six months later, he stated that he had gained greatly in general health, and that his vision had improved.

CASE 3. This case was reported also by Dr. Edward Jackson (13, case 3) in the same paper as Case 1. In 1915 the patient, a male, aged twenty-five years, had the first hemorrhage in the right vitreous. Six months after the onset he consulted Dr. Arnold Knapp, of New York City, who pronounced the condition tuberculosis and put him on tuberculin. There was temporary improvement, but later a recurrence of activity, with great loss of vision in the right eye. In December, 1916, when he was first seen by Dr. Jackson, V.R.E., moving fingers at 1 foot; L.E., with correction, 1.1. The right vitreous was cloudy; no fundus details were visible. There was a grayish-red reflex in all directions and floating masses, which in the lower temporal vitreous looked almost like detached retina, but no vessels were found. Left eye, slight haziness of vitreous. Choroid rather patchy and "moth eaten," otherwise the fundus was normal. Infiltration of the apices of the lungs, especially the right, was found. Two hemorrhages occurred into the vitreous of the right eye—one in February and the other in April of 1917. The eyes then remained quiet until November 10, 1921, when the vision of the left eye was suddenly obscured in the upper field. He had been free from trouble for so long that he had disregarded his general health and was run down because of overwork indoors. Dr. Jackson referred the patient to me, and I found, V.R.E., light perception; L.E., 0.8. The fundus of the right eye was the same as reported in 1917. The vitreous of the left eye was uniformly hazy. A large, hammock shaped subhyaloid hemorrhage was noted in the lower portion of the eye, extending from a mass of retinitis proliferans on the temporal side, near one of the terminal branches of the lower temporal vein, to a second similar mass along the first branch of the lower nasal vein (Fig. 1). A smaller subhyaloid hemorrhage was seen about 4 d.d. above the nerve head, in the region of a scar which covered a vertical vein. There were hemorrhages into the retina surrounding the masses of scar tissue. The blood absorbed slowly and was replaced, in part, by bands of scar tissue. Tuberculin in small doses (1/500,000 mgm.) was given and gradually increased. December 23, twenty-four hours after the administration of a dose of 1/100,000 mgm. of tuberculin, new retinal hemorrhages occurred. This was a focal reaction, and the size of the dose was diminished. January 13, 1921, V.L.E., 1.1. January 19, during the excitement of making a political speech, contrary to instructions, the vision suddenly became obscured, due to a hem-

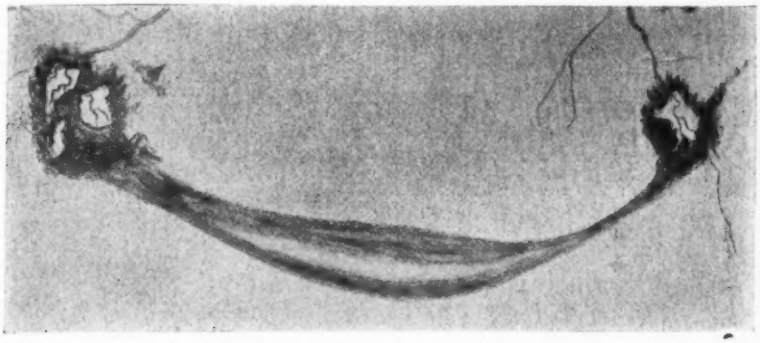

Fig. 1.—Retinitis proliferans. Subhyoid hemorrhages. Hemorrhages into the retina.

orrhage into the lower vitreous in about the same location as the former one. The blood absorbed more slowly, and when last seen March 8, there was still some haziness of the lower vitreous and dark blood in the retina around the scar tissue. The patient was ordered to stop work and was sent to a sanatorium, where he could be under supervision. He reported a few weeks ago that he had improved greatly in general health, and that there had been no new hemorrhages.

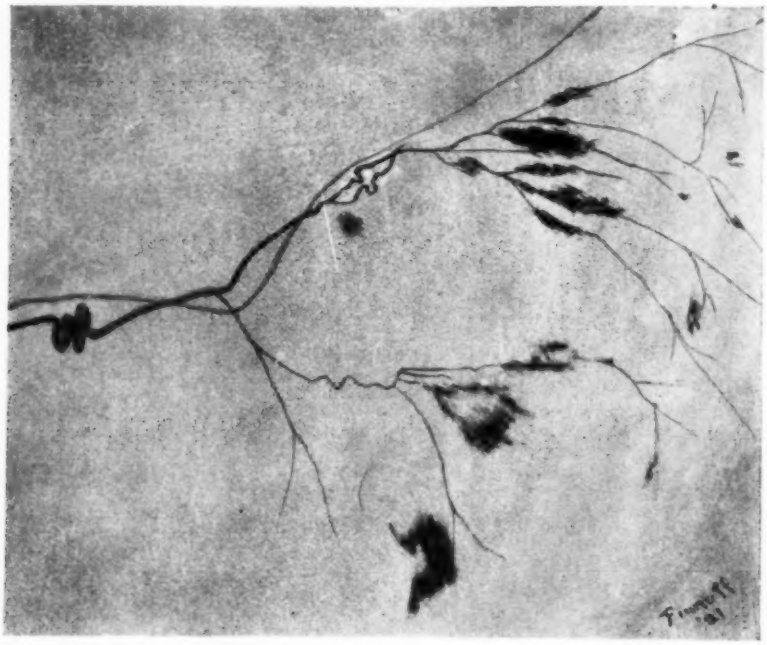

Fig. 2.—Tortuous and distended veins. Venous hemorrhages into retina. Perivascular exudates and exudates into retina.

CASE 4. K.E.F., aged thirty-five years, first seen April 2, 1921. Two weeks before, while walking, the vision of the right eye suddenly became hazy; the vision gradually improved, until April 1, when the vision in the same eye was almost completely lost. The second attack occurred while he was sitting at his desk writing.

There was no history of tuberculosis or hemophilia in his family. He had the usual diseases of childhood without complications. Four years ago he had severe articular rheumatism, which cleared up, and he gained 40 pounds after the extraction of six decayed teeth. About two and one-half years ago he had a severe attack of influenza, but recovered without complications. In December, 1920, he had acute tonsillitis. Since childhood he has had frequent attacks of epistaxis, but has not had bleeding from the nose for several months. He has never suffered from constipation. V.R.E., 0.08; L.E., 1.1. Ophthalmoscope: Cornea and lens clear; vitreous clouded, due to the presence of blood. Only the extreme nasal side of the fundus could be seen. In this portion the upper nasal vein was found to be distended and tortuous, and did not diminish in size toward the periphery, distally to the entrance of good sized contributing branches. In the peripheral portion, two veins were distended and tortuous. They were bordered, for a short distance, by a fine white exudate into which one of the veins finally disappeared. The accompanying artery was obscured by exudate in this region. A small retinal hemorrhage was seen slightly below the area of

exudation. Further to the periphery, numerous hemorrhages of venous origin were seen in the retina. In the extreme periphery, as far forward as one could see, the retina contained a silvery white exudate. The vessels were visible over this portion of the retina, and several small areas of hemorrhage were noted in it (Fig. 2). In the lower portion of the eye, large subhyaloid and vitreous hemorrhages were seen. Left eye: the media were clear. The veins were slightly distended, but showed no signs of disease, otherwise, the fundus was normal.

Blood Wassermann, blood counts, and urine were negative. Systolic blood pressure, 118 mm. of mercury. Coagulation time of blood (capillary tube method), four minutes, twenty seconds. Two apical abscesses were found in X-ray pictures of the teeth. The involved teeth were removed, and the abscesses drained. The surgeon thought the tonsils did not show pathology enough for removal. April 12, V.R.E., 0.1; L., 1.1. The vitreous had cleared slightly, but no further details could be made out. Old tuberculin, 0.005 mgm., was given subcutaneously, with no local, constitutional, or focal reaction. Increasing doses of tuberculin were injected every forty-eight hours until a 5 mgm. dose had been given; no reaction was obtained, and tuberculosis was excluded as the etiology. It was insisted upon that the tonsils be removed, to exclude every possible focus of infection, and potassium iodid and thyroid extract were prescribed.

May 16, the vitreous had cleared considerably since the last examination. The outline of the disc could be seen. A number of small retinal hemorrhages had absorbed. V.R.E., 0.6; L.E., 1.1.

Case 5. G. L., aged thirty years. Family history for tuberculosis and hemophilia negative. He had the usual diseases of childhood and always had suffered from a severe form of constipation. When fourteen or fifteen years of age, the muscles of his legs became weak, and he developed a toe-drop; later this weakness progressed upward, and finally he lost the use of his legs. For a time he had incontinence of urine and feces, but has regained control of the bladder and bowels. X-ray examination of the spine was negative. Tonsils were removed five years ago. About seven years previously he was told that he had some weakness of the eye muscles, and a partial tenotomy of both external recti was done.

About nine months before examination, the vision of both eyes blurred rather suddenly, and he consulted an optician, who gave him glasses (0.50 spheres for each eye) and assured him that his vision would improve if he wore them. The vision gradually improved and almost regained its former acuity. About the same time that the vision began to fail, he had a severe intestinal disturbance which confined him to his bed for several weeks.

The patient had been feeling well, and his eyes had been comfortable until two weeks before consultation, when the vision of the right eye suddenly failed. When first seen, April 15, 1921, V.R.E., 0.03 eccentric; L.E., 1.0. Ophthalmoscope: Right eye; cornea and lens clear; vitreous filled with large masses of blood, which obscured all fundus details. Left eye: Cornea and lens clear; vitreous clear, excepting in lower temporal quadrant, in which location a Y-shaped, white, veil like mass of retinitis proliferans was detected; it extended forward into the vitreous about 7 D., and slightly obscured the details of a branch of the lower temporal vein (Fig. 3). The veins were all slightly tortuous. The upper temporal vein was apparently obscured over a small area by thickened retina and a thin veil of scar tissue, which was located about 5 d.d. from the margin of the nerve (Fig. 4). Beyond the obscured area, the vein was convoluted in the region of a round mass of retinal pigment. A branch of the vein entered the main trunk near the mass of pigment. Following the branch from the main trunk toward the periphery, it was seen to

cross the pigmented area, and a portion of it was covered by pigment. The vein then took a straight course and was bordered on both sides by a fine white streak, apparently a scar. It then suddenly thinned to about half of its diameter and became very tortuous. The thinned portion of the vein had several branches: a lower branch of it crossed the main trunk, and its caliber was seen to be very much greater than the vein that it emptied into. Two or three round patches of retinal pigment were seen near veins on the nasal side of fundus (Fig. 5).

Fig. 3.—Retinitis proliferans and tortuous vein.

This covers a series of five cases of massive hemorrhages into the vitreous; all occurred in males; their ages ranged, at the time of the first attack, from twenty-five to forty-seven years. In all the cases the right eye was the first involved, and the greatest amount of destruction had taken place in it.

In Cases 1 and 3 a focal reaction occurred following the administration of tuberculin, and in Case 2 the man had pulmonary tuberculosis and lost weight just before the occurrence of the intraocular hemorrhage. Cases 1 and 3 improved after the administration of tuberculin, and Case 2 improved with the improvement of his general health. In Cases 1 and 2 there was a visible periphlebitis with patches of white and yellowish exudate in the

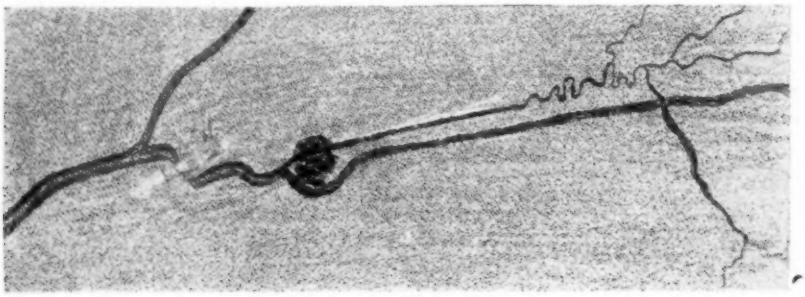

Fig. 4.—Irregular and tortuous veins. Retinitis proliferans. Area of retinal pigment changes.

There were no hemorrhages or exudates. The fundus changes were old, probably the result of inflammation which had occurred nine months before. The blood and spinal Wassermann reactions and the urine were negative. The teeth were negative, and nothing was found in the chest. Blood pressure, 125 mm. of mercury. Old tuberculin was given for diagnostic purposes, and no constitutional or focal reaction was obtained after the administration of 5 mgm. subcutaneously. May 6, V.R.E., 0.2, eccentric. The vitreous had cleared quite decidedly, especially in the upper third of the upper temporal quadrant.

proximity of the veins; and in Case 1 these patches were seen to spread along the veins and preceded the hemorrhages. Cases 1, 2 and 3 were due to tuberculosis. In all the cases the veins were tortuous and irregular in caliber, and the peripheral branches were frequently relatively larger than normal when compared with the main trunk. In Case 1, and apparently in Cases 3, 4, and 5, the earlier changes were in the periphery of the fundus in the beginning, before the appearance of hemorrhages. In Case 4, the inflammatory process was most marked in the retina, and in Case 5, there were patches of retinal pigment which was secondary to retinal inflammation. In Cases 4 and 5 tuberculosis was excluded: the possible cause of 4 was focal infection from abscesses at the apices of teeth and infected tonsils. In Case 5 the attacks were associated with severe intestinal disturbance, and the possibility of focal infection from the intestines was considered.

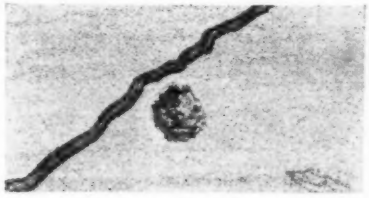

Fig. 5.—Mass of retinal pigment near tortuous vein.

The conclusions derived from the study of the literature and the foregoing cases are:

1. Recurrent hemorrhages into retina and vitreous in young persons is probably not a specific disease.

2. Tuberculosis of the retinal vessels, especially the veins, is one of the common etiologic factors.

(*a*) To prove that the cause is tuberculous, a focal reaction should be obtained.

(*b*) When due to tuberculosis, improvement follows the administration of tuberculin and hygienic treatment.

3. Syphilis is an occasional cause.

4. Focal infection is a possible cause.

5. Hemophilia is not a cause, but might be a contributing factor.

6. The hemorrhages are the result of a localized pathologic weakening of the bloodvessels, and increased blood pressure or exercise are only exciting causes.

7. The veins are usually attacked.

8. In some cases there is involvement of the retina early in the disease.

9. In most cases the earlier changes occur in the periphery of the eye, and if patients were examined in the early stages of the disease, we would learn more about the pathology.

10. Retinitis proliferans occurs in most cases.

11. I believe the disease is primarily in the retina, and that the partial or complete detachment of the retina is due to traction from scar tissue and not to subretinal hemorrhages from the choroidal vessels, as has been suggested.

12. The prognosis is poor; both eyes usually become affected, and in most cases the vision is markedly diminished.

13. The disease is much more frequent in men. When occurring in women, it is usually not so severe.

I have reviewed all the literature that was available and collected 110 cases. This material has been arranged in tabular form (See Transactions Amer. Ophth. Soc., v. 19, p. 248), giving the sex; age of the patient at the time of the first hemorrhage; the etiology; the first eye to become involved; whether the second eye was attacked; and the bibliography.

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CONGENITAL ANTERIOR CAPSULAR CATARACT.

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The history of five cases of congenital anterior capsular cataract occurring in three sisters and two brothers is here given together with the operative treatment resorted to. Read at the Philadelphia meeting of the American Academy of Ophthalmology and Oto-Laryngology, October, 1921.

The interest in this paper centers in that an entire family, consisting of five children, all developed in both eyes congenital anterior capsular cataract; again that in three of the women we found corneal opacities; and that the capsular cataract in two of the women was followed later in life by total lens opacity with subsequent liquefaction of the lens fibers. Again in Case 2, after vision had been restored in childhood by an iridectomy made downward and inward and remained good thruout school life and early womanhood, it was again lost for some six years, probably thru lens displacement, then spontaneously restored only to be again lost because of lens displacement into the iridectomy coloboma. And lastly in the operative measures undertaken for sight restoration.

The following are the case histories of this family:

Case 1. A. V. B., aged 35 years, a resident of Clay, Ky., consulted me May 7, 1914. Father and mother living and have good eyesight. He is married, robust in appearance and the father of a son ten years old with good sight. He has no recollection of ever having had a sore eye. The cornea shows no evidence of previous disease and the pupils react to light. Occupying the central pupillary area, we found a circumscribed whitish opacity lying within the anterior lens capsule but in front of the lens. Surmounting the opacity is seen a small spurlike elevation of clearer consistency and more grayish appearance. Vision: O.D., 15/80 and Snellen D = 1.50; O.S., the counting of fingers at five feet. Ophthalmoscopic examination with plane mirror, after cocain mydriasis, disclosed the lenses transparent and the fundus healthy.

A limited needling of the left lens was made with but slight reaction and at the expiration of six days he left the hospital with instructions to continue the daily use of atropin. On July 20 over half of the lens substance had been absorbed, and he counted fingers at ten feet. A more extensive needling was made, the atropin continued with an ultimate result of vision +12.00 =15/40 and Sn. D.=0.65 with + 16.00. The original capsular thickening remains but is displaced upward under the upper pupillary border.

CASE 2. Mrs. N. G., a widow 49 years of age and residence Boxville, Ky., consulted me Dec. 25, 1920. At the age of twelve she was operated upon in Atlanta, Ga., by the elder Dr. Calhoun, who made a double iridectomy downward and inward, establishing vision in the right eye, sufficient for the needs of her school life. Vision in the left eye was not so good. At the age of 25, sight again failed and during the following six years she was unable to read, when spontaneously the sight returned and was preserved until Sept., 1920, when in two days and associated with dazzling and vomiting, she became almost blind.

I found old corneal opacities in both eyes; the iris very tremulous, that of the left likewise discolored. The right lens was wholly opaque, of a putty gray appearance with a central circumscribed capsular thickening from the base of which arose a small pyramidal outgrowth. The lens was displaced downwards and obstructed the iridectomy coloboma. Vision in the eye that of the counting of fingers directly in front of the eye. The left eye presented a dense whitish thickening of the entire anterior capsule, which appears united with the posterior capsule. Of the lens there remained only debris located directly beneath the original capsular thickening upon which is preserved a pyramidal elevation. Vision in the eye is thru a small space between the lower edge of the capsule and the periphery of the coloboma, and is limited to the counting of fingers at five to six feet.

Dec. 27th an opening was made thru the cornea below, and the fluid lens extracted within its capsule. Vision obtained, 15/65 with +11.00 and the reading Sn. D.=0.75 with +16.00. The visual loss is largely due to an old pre-existing corneal opacity.

CASE 3. Estelle B., unmarried and 35 yrs. of age, consulted me Dec. 13, 1920. In either eye above and below there is an old corneal opacity. She denies ever having had a sore eye. The right lens is opaque thruout with a more circumscribed and denser capsular thickening within the pupillary area upon the base of which rests a small pyramidal spur. Vision is limited to hand movements at a few inches distance. The left eye shows an anterior capsular cataract with some involvement of the anterior lens fibers. Vision, the counting of fingers at twenty feet. The right lens was needled and the degenerated flaky fluid lens evacuated into the anterior chamber. During the succeeding twelve hours decided reaction followed, accompanied by pain in the eye, vomiting and increased intraocular tension to 44 mm., measured by the Gradle-Schiötz tonometer. Linear extraction was made which relieved the pain and tension, and at the expiration of six days she returned to her home.

On May 13, 1921, discission operation with a Ziegler knife and the capsular opacity displaced upward, back of the iris. A visual result of 15/L. with +10.00 sphere was obtained. June 10th she reported that the capsular cataract had dropped down into the pupillary area and obstructed her sight. June 21st thru a linear corneal incision made below, the capsular cataract after some effort was grasped with forceps and extracted and sent to Dr. F. H. Verhoeff of Boston for microscopic examination, who reported the following:

"The specimen is a typical anterior polar cataract of the pyramidal type. Its base is 2 mm. in diameter and its apex is elevated about 1 mm. It consists essentially of a degenerated laminated hyalin mass completely surrounded by a capsule similar to that of a normal lens. The anterior central portion is almost entirely devoid of cells, altho here and there necrotic nuclei may be seen. At the base a considerable number of elongated epithelial cells are present and also a few cell masses. There are here also large deposits of calcium salts. An occasional cell is found beneath the capsule covering the anterior surface of the cataract, and exactly at the apex

there is a small group of epithelial cells which have formed a new capsule around them. These cells are thus in the act of forming another minute pyramidal cataract at the apex of the original one."

An active iridocyclitis followed the capsule extraction with heavy vitreous opacities. By Oct. 3rd absorption of these opacities had progressed to the extent that vision 15/100 is again obtained.

CASE 4. Joe B., aged 9 years, consulted me March 1, 1903. He presented in either eye a small circumscribed anterior pyramidal capsular cataract; outside of the capsular thickening the lens is transparent. Ophthalmoscopic examination disclosed below the optic disc, both eyes, a small conus, otherwise no fundus lesion. Vision, 15/50 and Sn. D.=0.50, either eye. Nov. 7, 1920, again examined, the eyes presenting much the same appearance as eighteen years ago. Distance vision still 15/50 but near vision reduced to Sn. D.=1.00.

May 2, 1921, again examined: Vision O.D.,15/100 and Sn. D. =1.50; O. S., 15/16 and Sn. D.=1.25. With the ophthalmoscope it was seen that the underlying lens fibers, especially in the right eye, were becoming more and more opaque. The right lens was rather freely needled and the patient permitted to return home on the fifth day. When last seen in July, absorption of the lens was slowly going on but at least one other needle operation will be required.

CASE 5. Mrs. A. M., age 43 years, residence, Owensboro, Ky., was examined April 10, 1919, and found to have anterior capsular cataract, both eyes. She went thru school life without difficulty but during the past three years is aware of sight failure. Vision: O.D., the counting of fingers at 15 ft. improved to 15/100 with $+1.50 \supset -3.50$ cyl. ax. 120°; O.S., counts fingers at 15 ft. The eye is highly astigmatic with axis oblique, and not subject to sight improvement with lenses. Both corneas show old opacities, altho she does not recall ever having had sore eyes.

THE PATHOLOGY of congenital anterior capsular cataract is still incomplete. We can accept as partial explanation a disturbance of development of the epithelial capsular lining, but the underlying cause for such disturbance is not clear. It certainly is not the result of misplaced embryonal cells, since no one has reported the finding of extraneous tissue formation within the capsule in these cases. Again it cannot be the result of bacterial invasion of the lens capsule, since this membrane remains unbroken over the opacity, and pathology teaches that bacteria as a rule are incapable of penetrating an unbroken membrane.

Treacher Collins[1] advances a tension theory in explanation for the early stage of capsular opacity. He believes that because of contact between the lens capsule and cornea, the underlying lens fibers undergo shrinkage and break up into hyalin globules and detritus because of disturbed osmosis. Due to this shrinkage, the tension of the capsule at the anterior pole of the eye is lessened and thus the only obstacle to rapid proliferation of the capsular cells is removed.

To me a more plausible explanation is that of invasion of the capsule by a soluble toxin, the result of an inflammation in some part of the anterior portion of the eye, maybe diseased cornea, iris or pupillary membrane. Three of my patients had corneal opacities in both eyes, evidence of previous eye disease. Nor does the fact that both eyes are similarly involved not alone in one member but in others of the family render this theory untenable. We all recognize that interstitial keratitis, the result of inherited syphilis, is prone to involve both eyes, and that it may appear in more than one child. Whether the infection in anterior congenital capsular cataract is likewise of syphilitic origin I have no evidence to offer. The development of the lens begins very early in fetal life, in its fourth week, and until the end of the third month the lens is in close relation with the anterior eye segment, so that disease in this part

of the eye may readily affect the lens and its membrane.

Again the pathologic histology, according to O. Becker,[2] of this affection is similar to that of acquired anterior capsular cataract seen in early childhood after corneal ulceration. The primary response to the toxin is one of focal epithelial cellular proliferation within the capsule in the uncovered pupillary area, with the formation of a cloudy excrescence, that may be flat or surmounted by a small spur like elevation. The capsule, be it remembered, is thinnest at the anterior pole of the lens represented by the intrapupillary area, and readily bulges over an underlying coagulated exudate.

Soon degenerative changes occur, especially in the cells directly beneath the protruding capsule; the cells develop large vesicles, lose their nuclei, break down and take part in the formation of a laminated hyalin excrescence over which the capsular membrane continues unbroken. In the deeper portion of the excrescence the cellular necrosis is not so complete, and there one finds a stratified formation made up largely of spindle shaped cells; while next to the lens, in older cataracts at least, a thin layer of normal epithelial cells may be preserved.

These cells, according to Parsons,[3] are capable of normal functional activity as evidenced by the production of a new cuticular membrane directly overlying them and limiting posteriorly the subcapsular excrescence. In old people it is my experience that anterior capsular cataract may result after circumscribed central corneal perforation, the result of a serpiginous ulcer, but that early and complete lens opacity follows.

The reported finding by Verhoeff of a small group of cells at the apex of the pyramidal opacity that had formed another new capsule around them and were in the act of producing another minute pyramidal cataract, is not only unique but interesting. It is my belief that these cells came from original peripheral capsule cells and were excited to proliferation thru the reaction that followed the first needle operation; since Arlt[4] states he found no cells in the outer two-thirds of the opacity in a case of anterior capsular cataract examined by him. In addition to vesicular degeneration, we find molecular fatty and calcareous degeneration and at times cholesterin formation, especially in the deeper and older portions of the excrescence. The lens fibers immediately underlying the capsular opacity sooner or later in many cases undergo cataractous degeneration with excavation.

OPERATIONS: Is it preferable to do an iridectomy or a discission operation, and what should influence us in making a choice? Where vision is decidedly better after mydriasis and it is reasonably certain that the capsular opacity will not be followed later in life by extensive lens opacity, the advantages of retained accommodation, especially in the child, should influence one to do an iridectomy. However, I know of no way of foretelling that the lens will not later in life become cataractous and because of this, if an iridectomy is made, I should prefer to do it above rather than below. Of course the amount of vision we hope to establish should not be left out of consideration in determining the site. In adult life, where glasses must soon be resorted to for near work, I should prefer to do a discission operation. It is almost needless to add in persons where the capsular cataract is small and interferes but little with sight, nothing should be done in the way of an operation.

1. Collins and Mayou. Pathology and Bacteriology, International System Ophthalmic Practice.
2. O. Becker. Graefe-Saemish, Handbuch der gesammten Augenheilkunde.
3. Parsons' Pathology of the Eye, Vol. 2.
4. Arlt. Histologie des Auges.

NOTES, CASES AND INSTRUMENTS

APPARENT PITUITARY TUMOR WITH RESTORATION OF VISION.

WALDRON A. CASSIDY, M.D., and SANFORD R. GIFFORD, M.D.

OMAHA, NEBRASKA.

Mr. E., a man of 34, was seen in Dr. Harold Gifford's office December 2, 1918. He complained of failing vision in his right eye for the past six months, in the left eye for the past six weeks. For several weeks, he had been subject to headaches, with nausea. Vision was: Right eye, shadows; left eye, 20/200, not improved by lenses. The fundi were normal. The field was, as shown in the figure, not typical of pituitary tumor. The patient's whole appearance, however, was that of an acromegalic. The superciliary ridges were very prominent, the nose large and heavy, the lower jaw prognathic. The hands were large and heavy, with clubbed ends, and the feet were long. He had noticed a change of physiognomy in the last year. X-ray showed a sella obliterated and its site occupied by a shadow which the radiographer interpreted as probably a tumor, involving a large area of the neighboring brain. Nose and throat examination was negative. The patient stated that Wassermanns performed on his blood and spinal fluid a few months before at the Mayo Clinic had been negative, and that he was told there was evidence of a brain tumor in his case. As he refused all thought of operative interference, the patient was sent home, and told to take five grains of thyroid extract daily, under observation of his family doctor.

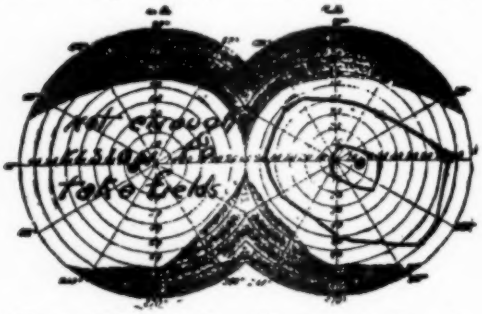


Fig. 1. Fields of vision, Mr. E., 1918, Dec. 2.

He was lost track of until May 14, 1921, when he returned to report his good condition. He stated that vision had begun to return soon after he returned home. He had taken thyroid regularly for a year, and since then irregularly, resuming it whenever he was warned by a slight headache. Examination at this time, two and a half years after his first visit, showed vision 20/20 in each eye, with fields as shown. The fundi were normal. While the general appearance showed no change in essential landmarks, his appearance was healthy and he stated that, except for occasional headaches, he had been in perfect health for the past two years. He was told to continue thyroid two weeks out of every month. Another X-ray could not be obtained at this time.

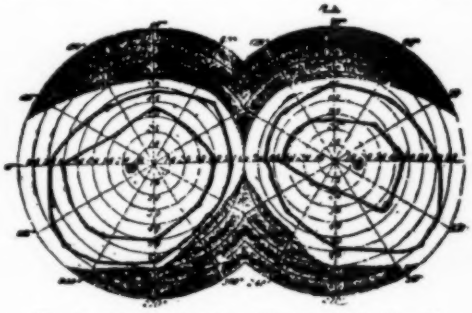


Fig. 2.—Fields of vision, Mr. E., 1921, May 14.

To the question: "Did this patient have a pituitary tumor?" of course no definite answer can be given. Certainly all the signs except the field pointed to a tumor in the neighborhood of the pituitary. No more definite conclusion can be reached as to the effect of the thyroid extract. Tho apparent improvement has followed its use in many hands, the basis of such treatment is still empiric. Cases of spontaneous rupture of a cyst have been reported, and on the whole, this seems the most likely explanation of the course in our case.

It seemed worth while to report this case as a reminder, in giving a prognosis, that recovery, or at least lengthy remission, may occur without operation in patients presenting this syndrome.

RECURCING MYXOSARCOMA OF ORBIT.

J. H. Buckley, M.D.

FORT SMITH, ARK.

Mrs. L., age 38. In January, 1918, pain of much intensity began in the upper jaw and upper teeth, followed by an inflammatory condition of left eye. On January 24th she consulted an oculist. A Wassermann was negative, and X-ray showed nothing. A general surgeon advised removal of eye ball. A small hardness could be felt just under roof of left orbit. This was removed by her oculist May 27th, 1918, and a specimen sent to St. Louis. Laboratory report, a nonmalignant inflammatory tissue.

During the last week of August, 1918, she came under my care, at which time the eye and surrounding tissues were quiet, but the globe protruded one-fourth of an inch, and a firm hard mass could be very definitely palpated upon the floor of the orbit. On Sept. 2nd, 1918, I removed this mass. It was one-eighth of an inch thick, one-half inch wide and three-fourths of an inch in the anteroposterior diameter, extending back of the equator of the ball, which caused the protrusion. Laboratory report of this speciman myxosarcoma.

The wound healed by first intention, and the eye resumed its proper place within the orbit. In March, 1919, I refracted this woman, prescribing a plus three-quarter diopter sphere for each eye. June 13th, 1920, she visited me on account of a mild iritis and bulbar conjunctivitis of right eye. Responded nicely to treatment, but would occassionally "light up" again.

August 10, 1920, she went to one of the Carolinas on a vacation. Soon after reaching there she noticed a small tumor above the right eye. When she reached home in September, the eye was closed and she was unable to open it. The ball was pushed forward fully three-eighths of an inch. The accompanying cut gives an excellent idea of the appearance of a front view. The half-tone also shows both upper and lower tumors pushing forward the skin in front of them (See Fig. 1).

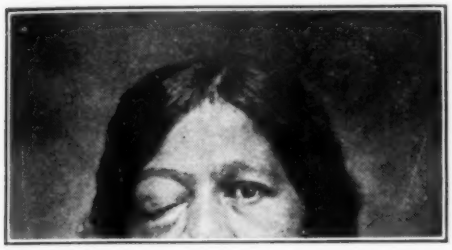


Fig. 1.—Recurrent orbital tumor. (Buckley's case.)

Fig. 2.—Result of removal of tumor and plastic operation.

On September 23, 1920, I removed these tumors. Incorporated in the upper tumor was much of the elevator of the upper lid, and some of this muscle was necessarily removed with the upper tumor. The upper tumor lay between the eye ball and the roof of the orbit. These tumors were of a dirty white color and in consistency quite hard, the same color and density as the tumor I removed from floor of the left orbit two years before. Both these tumors according to laboratory report were myxosarcomata. The upper tumor measured one-half inch anteroposterior diameter, one-half inch wide and three-eighths inch thick. The lower tumor three-fourths inch anteroposterior diameter, one-half inch wide and one-quarter inch thick.

After all inflammation and reaction

subsided, the eye resumed its position in the orbit. The complete ptosis, however, remained. I made a flat tongue of skin from the upper lid running the same thru a tunnel under the eyebrow, and attached it to the occipitofrontalis muscle, and the accompanying cut shows the results which are very satisfactory to the patient. She can open and close either eye separately or both simultaneously. (See Fig. 2.)

This is quite interesting and especially so since the woman had three separate and distinct myxosarcomata. She had occasion to phone me about two weeks ago about another matter, and volunteered the information that both her eyes "are fine."

CHART FOR TESTING VISION OF CHILDREN AND ADULTS—LITERATE AND ILLITERATE.

G. A. Sulzer, M.D., F.A.C.S.

COLUMBUS, OHIO.

This chart is composed of two columns of three minute characters, varying in size from one hundred to five meters in the left hand column, and from eighty to four meters in the right hand column. Either column may be used to quickly determine the vision for distance. On reaching the seven meter characters, the patient will find a very great difficulty in memorizing them, as sixteen characters have been arranged in the form of a square, making possible twenty different directions in which they may be read. (See p. 209.)

The sizes of six, five and four have been made in the same way, making a very practical series for finer subjective tests of the refraction of the eye.

A small hand card to measure the accommodation accompanies the large one, making a complete series from one hundred to thirty eight hundredths meters, all of the same angle and form. These cards have been in practical use for several months to the exclusion of letters, and have given great satisfaction to the designer. A little patience will be rewarded by more positive results in subjective refraction.

In reading the characters, the patient is asked to state the direction of the opening; whether to the right, left, up or down, or to the right and up, right and down, left and up, or left and down. The diagonally placed characters assist in the detection of slight astigmia, as well as the determination or proving of the axis. The charts may be universally used—in the office, clinic, factory, school, army and navy, in any and every country, for persons of all nationalities and even to test deaf mutes. Finally it must be recalled that this character, first suggested by Dr. Jackson, is essentially similar to the official, broken ring test developed by Landolt and adopted by International Committee of Ophthalmologists appointed for that purpose.

ONE ADVANTAGE OF SINGLE VISION.

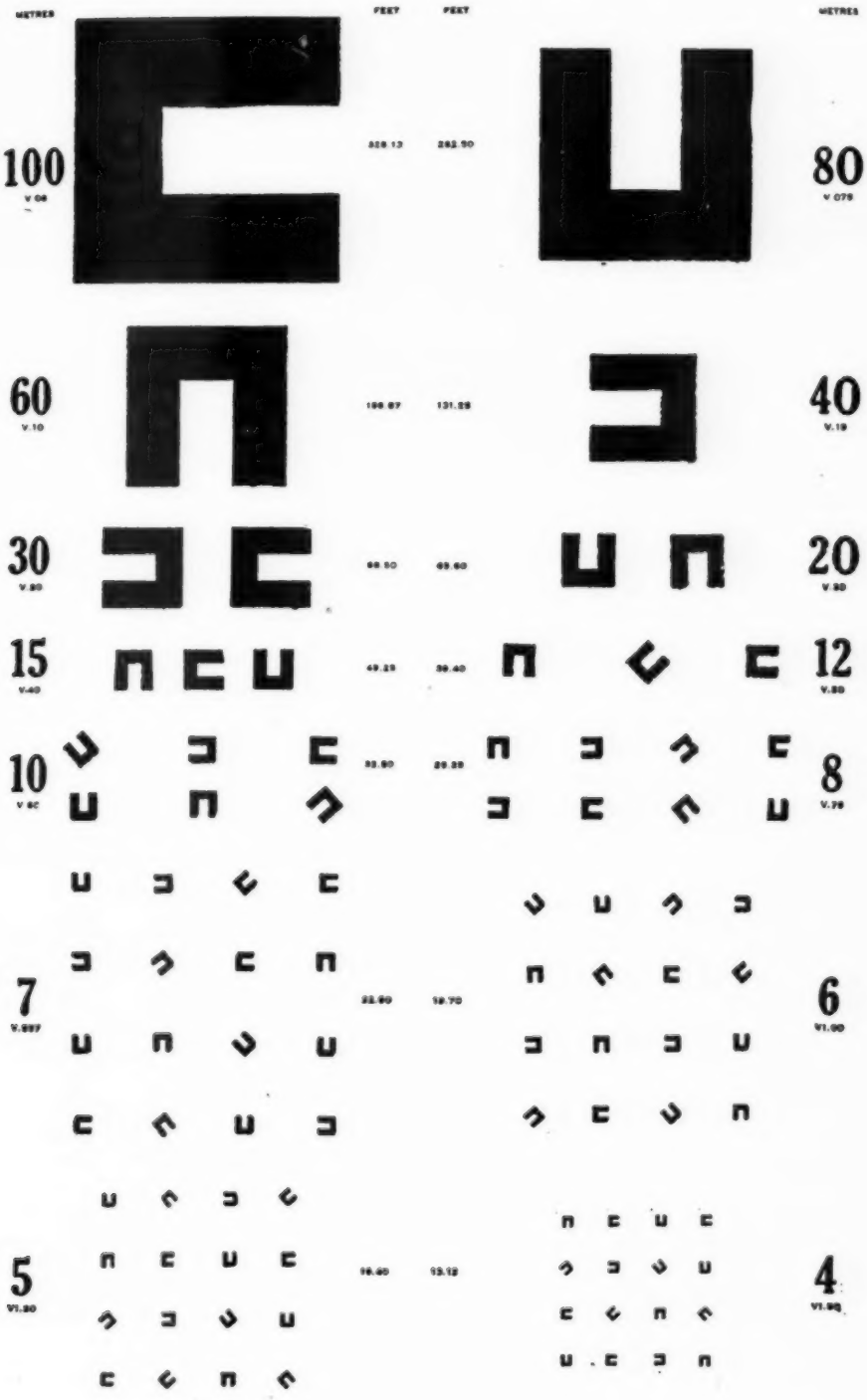
Edward J. Brown, M.D.

MINNEAPOLIS.

The title of this paper might be The Advantage of Having But One Eye. Of course there can be but one advantage of such a condition, and that is freedom from the effort and strain involved in binocular single vision. My attention was especially called to this matter a few months ago when I succeeded in examining the eyes of a very cranky old man whom I had had for an ear patient many years, but whose eyes I had not been afforded the opportunity to examine. Such examinations as I have been able to make have been either incomplete from my own lack of appreciation of field and blind spot determinations in the early years, or from the man's obstinacy.

He is now nearly 88 years of age. When a child he had convergence of the right eye, and in his late youth the internal rectus of the eye was tenotomized by a rural oculist or surgeon. In 1913 when he was 78 years of age,

DR. G. A. SULZER'S CHART FOR THE ACCURATE TESTING OF VISION AND FOR THE FINER DETERMINATIONS IN SUBJECTIVE REFRACTION.



he had been wearing for years R. plus 5.50 and L. plus 4.50 for reading. I found:

R. +3.50⌒+0.25 c. 90°=20/70, L. +2.50⌒+0.25 c. 90°=20/20. Add +2.50, J. 1. Muscles: R. H. 1°, Esoph. 0, at 13 inches, Exoph. 17°, *Diplopia at 20 feet with refractive correction.* Images brought to near fusion with prism 4° base in. *He was given near correction only.*

A late examination is as follows: R. + 3.50⌒+0.50 c. 180°=20/50, L. + 2.⌒+0.25 c. 180°=20/30, + 3., J. 1. Esophoria 16°. The corneas anesthetic, anterior chambers shallow, pupils 2 mm., normal reactions, dilate quickly to 5 mm. with one drop of 1% cocain. There are peripheric striae of the right lens, both discs are moderately cupped, and tension seemed about normal, 25-30 with Brown tonometer. The blind spots could not be demonstrated. The form fields were almost entirely normal, even the color fields much better than I often find them in comparatively young people. So far as I have been able to examine other cases with squint or one blind eye, the results have strongly corroborated the findings in the above case, that the absence of muscular strain has been a safeguard. Such results are also in corroboration of my often repeated thesis, that the one great and universal cause of chronic simple glaucoma is eye strain.

TRANSPLANTATION OF ENTIRE VERTICAL RECTI FOR ABDUCENS PALSY,

RODERIC O'CONNOR, M.D.

SAN FRANCISCO, CALIF.

In a paper on Transplantations of Ocular Muscles read at the 1921 Colorado Congress, I suggested (A. J. O., v. 4, p. 839, Nov. 1921) that transplantation of the entire vertical recti for abducens palsy would, by relieving tension on stitches, give better results than transplantation of the halves of these muscles. Since that date I have had one such case with perfect results which I wish to report.

Miss D. O., 13 years. Congenital abducens palsy. No outward rotation. Tests esophoria 20°, with left eye deviating downward 10° because of moderate left superior rectus paresis. Vision 20/20 each eye.

August 18, 1921. Operation according to figure 1 in the paper mentioned. The technic was extremely easy, the muscles laid over in their new locations with no pull whatever. Healing was prompt and uneventful. Outward rotation began to appear early and gradually increased until at this date (Nov. 26, 1921) the patient presents the following conditions:

Outward rotation 30 degrees of arc as measured by tropometer.

Cosmetic appearance perfect except in rotation to left when the affected eye shoots down and diplopia appears.

In primary position tests esophoria 1 degree.

Binocular vision of third degree tested by amblyoscope in ordinary reading position.

Converges to 3 inches on test light, keeping pupillary reflections symmetric.

Diplopia. None, except when looking to the left. She avoids this easily by head position.

In looking up the left eye lags, for which further work on that superior rectus is being considered but she uses her eyes so comfortably in all the ordinary positions that I may decide to "let well enough alone."

Finally I wish it to be remembered that in the operation the internal rectus was not even partially cut nor was the external shortened. I wished to find out just what could be secured by transplanting the vertical recti in their entirety.

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly the important scientific papers and discussions.

COLLEGE OF PHYSICIANS OF PHILADELPHIA, SECTION ON OPHTHALMOLOGY.

October 20, 1921.

DR. G. ORAM RING, CHAIRMAN.

Development of the Lacrimal Canal in Normal and Abnormal Conditions.

PROFESSOR J. VAN DER HOEVE, of Leiden, Holland, (by invitation) showed with lantern slides how the lacrimal ducts develop, according to the researches of Jouves, Matys, Contunni, Moneri, Schaeffer, Fleischer, and especially Ask. In the early period of fetal life, an island of epithelium is separated from the upper nasal part of the depth of the nasolacrimal groove. From this island sprouts develop, which grow up and down as solid cords—the nasolacrimal ducts and the lacrimal canals, which acquire a lumen at a much later time. In acquiring a lumen sometimes a part of the duct remains solid, and especially this may be the case with the nasolacrimal duct at the entrance in the nose, causing congenital atresia with subsequent dacryocystitis in newborn. Nature itself usually cures the condition spontaneously, but it must be treated by pressing on the lacrimal sac about every half hour; if, in the lapse of two weeks, the obstruction is not relieved a small probe must be passed. If the obstruction remains, it may give rise to an incurable and disagreeable dacryocystitis.

The lacrimal ducts grow out to the lids, and reach the free margin when the fetus is thirty-five mm. in length. The superior canal is the shorter, and inserts in the nasal angle. To reach the lacrimal lake it has to push away the anlage of the Meibomian glands, so that those glands in the upper lid, especially in its nasal part, are much closer to each other than in any other portion of the eyelid. They may overlap one another, as van der Hoeve showed in lantern slides of reconstruction by Ask. The lower duct in reaching the free margin of the eyelid cuts away part of the lid, with Meibomian and other glands, and the caruncle lowers itself and takes a position opposite to the lid, in the semilunar fold. The caruncle is thus formed by the lower lacrimal duct—without the duct the caruncle cannot develop.

This idea of Ask accounts, according to van der Hoeve, for a congenital aberration which he perceived in three patients. All had a nasal ankyloblepharon. The distance from the outer canthus was normal, but the inner canthus was 10 mm. larger than in normal persons of the same age, so that the eyelids were 5 mm. smaller than they should have been. The superior lacrimal point was present at its normal place, close to the abnormal internal canthus; the inferior lacrimal point, on the contrary, was just as far from the abnormal internal canthus as it ought to be from the normal, about 5 mm., consequently it did not dip in the lacrimal lake and the patients suffered from lacrimation. This condition can be explained by a congenital development. The anlage of the inferior lacrimal canal was too large, consequently a too big caruncle was separated from the lid, and this caused an irritation which made the lids grow together (ankyloblepharon).

There are authors, as Krischewiky, Halben, Kuöl, Krämer, and Depené, who believe that the epithelium of the free lid margin takes an active part in the formation of the canals, in that the entire canal, or at least a part, develops from the lid epithelium. One of the reasons which they give is the fact that in cases of coloboma palpebrae, sometimes of the inferior lid, the lacrimal point is found at the temporal side of the coloboma, and they reason that such would be impossible if the canals develop from the nasal side of the coloboma—they could not have crossed the coloboma. This seems to van der Hoeve to be poor reasoning, because

the canal can grow around the gap, as is shown in one of those cases where fluid, instilled in the inferior punctum, reached the nose, so that as the canal developed, it had grown around the coloboma. Van der Hoeve mentioned a patient, with an open oblique facial cleft from the interior eye angle to the mouth, which latter cut all the soft tissues to the bone, so that it was impossible for the canal to grow around it, and still the inferior lacrimal point was at the temporal side. Pressure on the sac produced mucopus in the nose and in the cleft. Irrigation in the superior lacrimal point gave fluid in the nose and in the cleft, in the inferior point only in the cleft, so that it seemed that a normal lacrimal apparatus was present in which only the inferior canal was cut thru by the cleft, which was proved by examination with the Roentgen rays.

Van der Hoeve referred the subject to Ask, and he made slides from a fetus of 35.5 mm. long, which he got from Bowman's laboratory, and he was so lucky as to get cuts which proved that the canals reach the free margins of the lids without the epithelium of the lid being active in any way. To explain the condition in the child it was possible that: (1) The "anlage" of the lacrimal apparatus is double at both sides of the nasolacrimal groove, and grows together when the groove closes; if it remains open both parts develop independently. (2) The influence which prevents the cleft from closing causes a part of the anlage to come to the other side. (3) The temporal part has really grown down from the lid epithelium or up from the cleft epithelium. All these suppositions were impossible, because the caruncle would have been where the inferior canal was, at the temporal side, whereas it was in its usual place at the nasal angle. This fact could only be explained by a normal development of the lacrimal ducts and a cutting thru of the inferior canal by a secondary cleft. Therefore, van der Hoeve ventured the hypothesis that in this case the ducts had developed in the normal way, and that afterwards a secondary cleft had developed caused by amnion bands, which had vanished entirely. We know that van Duyse and others explain many of the secondary open facial clefts by the action of amnion bands.

But, if this is right, then we must have a great many possibilities according to the time and place where the cleft develops. Ask and van der Hoeve built up a scheme of these possibilities, and divided them in four parts:

(1) Cleft is temporal to the anlage of the lacrimal punctum, so does not interfere with the apparatus or only cuts thru the lacrimal duct.

(2) Cleft is thru the anlage; if this happens before the sprouts are grown out, (about the sixth week of fetal life) we will find no lacrimal duct, caruncle, or sac; if the cleft develops later we find ducts and caruncle, but no sac.

(3) Cleft interferes with the lacrimal canals, either with the upper, the lower, or both. If this occurs early, before about the sixth week, when the duct has not as yet passed the dangerous spot, we find no lacrimal punctum; if it concerns the lower duct no caruncle either; when it occurs later the duct has passed the dangerous place, and we find a normal canal and punctum, but cut thru by the cleft. The inferior canal can end in the cleft or in the inner angle, nasal to the cleft, so that no space is left for a caruncle. Had the inferior canal already passed the dangerous place, it may end so close to the cleft that no caruncle is present, or so far that a caruncle is formed. The caruncle is formed when the canal reaches the free margin, about the tenth week of fetal life, then the caruncle goes to the interior angle and reaches its normal place about the fifth to the seventh month. If the cleft develops after the sixth week, and before the fifth to the seventh month, the caruncle cannot reach its place and remains either at the temporal side of the cleft or is cut thru in two pieces, one nasal and one temporal to the cleft, or is destroyed totally by the cleft. If

the cleft develops after the fifth to the seventh month, the caruncle is in its place, and the cleft only cuts thru the inferior canal as in the child, which was the beginning of these reflections.

(4) The cleft is temporal of the canals, and either does not touch at all the lacrimal apparatus or cuts thru the nasolacrimal duct. We can increase the amount of these possibilities *ad libitum* by making combinations of different disturbances of canals and nasolacrimal ducts. Ask has found a fetus with open horizontal facial cleft at the right side, thru which the amnion ran. It was caught in the mouth and went up over the left side of the facies and cut in this an oblique cleft, separating the eye and the eyelids in two parts, so that macroscopically the inferior lacrimal punctum and the caruncle were at the temporal side of the cleft. Microscopically he found that a small part of the caruncle was at the nasal side of the cleft, the caruncle was cut in two pieces by the amnion bands. This demonstrated van der Hoeve's hypothesis. The latter found in the anatomic museum in Amsterdam, under Director Professor Bolk, three feti. First specimen, placenta connected to the head, nose cut thru by the amnion bands, lacrimal ducts normal (Scheme part I). Second specimen, normal inferior ducts and caruncle, superior canal ending at the left side in the cleft, at the right side in cicatricial tissue, which destroyed the upper lid (Scheme part III). Third specimen, a fetus with no lacrimal ducts on one side (Scheme part II). At the other side a normal superior lacrimal canal, no inferior lacrimal point and no caruncle (Scheme part III).

The important conclusions of Prof. van der Hoeve's paper were:

(1) Ask's investigations of the development of the lacrimal caruncle explain some congenital aberrations.

(2) Most often facial clefts are of secondary nature, and caused by amnion bands.

(3) It is possible to point out by appreciating the conditions of the lacrimal canals, the nasolacrimal ducts and the caruncle, the time in which the amnion bands have exercised such an influence that they formed impassible barriers for the lacrimal ducts or the caruncle.

Discussion.—Dr. J. Parsons Schaeffer said that he thought Professor van der Hoeve had given a suggestive, if not acceptable, basis for a small group of anomalies that have hitherto puzzled investigators in this field.

In a paper read before this Section in March last on "The Modern Conception of the Nasolacrimal Passageways in Man," Dr. Schaeffer considered the normal development of the channels from a solid cord of epithelial cells which early begins to grow (32-day embryo) from the epithelium lining the depth of the obliterated nasooptic furrow, becomes detached and sinks into the underlying mesenchyme. Under normal conditions this solid cord of epithelial cells surrounded by mesenchyme, sprouts at both the ocular and nasal ends, the ocular sprout giving rise to the upper and lower lacrimal ducts, while the nasal sprout establishes connections with the mucosa of the inferior nasal meatus. A lumen is variously established in the solid mother cord and its secondary outsprouts, ultimately resulting in patulous channels from the free borders of the eyelids to the inferior nasal meatus. The last part to become patent is the point of connection of the nasolacrimal duct with the inferior nasal meatus—the lacrimonasal membrane disappearing about term.

At the same time he discussed the various rudiment potentials and the possibilities of abnormal development and the development of anatomic types: At times multiple secondary sprouts are encountered. These readily account for supernumerary lacrimal ducts to one or both eyelids. Wide points of contact with the free borders of the eyelids can readily result in multiple lacrimal puncta, or if the wide point of contact becomes entirely canalized, the slitlike punctum results. The marked variations in the anatomy

of the aperture of the nasolacrimal duct in the inferior nasal meatus is accounted for by the fact that the point and type of contact of the embryonic solid nasolacrimal cord with the mucous membrane of the inferior nasal meatus is inconstant. At times the point of contact is at the highest part of the inferior nasal meatus, giving rise to the wide and permanently open mouthed ostium, unguarded by a mucosal flap. Again, the point of contact is extensive along the lateral wall of the inferior nasal meatus, this resulting in multiple apertures or a single slitlike aperture guarded by a mucosal flap (valve of Hasner), etc., etc.

The solid nasolacrimal cord instead of presenting an even contour not infrequently has protruding from it short, solid sprouts (the usual ocular and nasal sprouts mentioned before). He believed that these secondary sprouts or buds are in many instances potential rudiments of nasolacrimal duct diverticula which are encountered in the adult. Indeed some grow to become additional lacrimal ducts. Very many are early resorbed. Lumen formation of the solid epithelial cords occurs very irregularly, accounting for mucosal flaps and ledges within the nasolacrimal duct later. Atresias here and there of the duct may be the result of retention of an embryonic condition; always recalling that the nasolacrimal passageways are at one time solid epithelial cords.

It is, therefore, clearly obvious that the genesis of certain variations or anomalous states is to be found in rudiment potentials. Other variations, like absent nasolacrimal ducts for one or both eyelids, in whole or in part, result from an arrested development. The causes here may be intrinsic or extrinsic, probably the latter. They are not clearly defined in this connection. Moreover, rare variants doubtless are the result of phylogenetic retention of a more primitive anatomy.

Despite the foregoing there are a few anomalous states in the anatomy of the nasolacrimal passageways encountered that appear to have no basis in rudiment potentials, in arrested development or in comparative anatomy. For examples, one now and then encounters a divided lacrimal duct for one or both eyelids, the lacrimal sac may be detached from the main nasolacrimal duct, the nasolacrimal duct proper may be found as two discontinuous segments, etc. It appears certain that the division of a lacrimal duct, or of the nasolacrimal duct proper, occurs secondarily, that is after the definitive connections are fully formed. In his former communication he spoke of the possibility of amniotic bands severing previously formed and continuous nasolacrimal passageways into secondarily discontinuous segments. Owing to the want of suitable material to substantiate his belief, he was unwilling at that time to hazard further discussion of them.

The researches of Ask on the development of the lacrimal caruncle are generally accepted as correct. Professor van der Hoeve and his coworker Ask have ingenuously used the developmental stages of the lacrimal caruncle in offering an interpretation of the obscure anomalies in question. The inferior lacrimal duct, for example, wholly grows from the mother cord of epithelial cells. When division of the duct in question into two discontinuous parts is found, some writers use it as an argument that the distal part of the lacrimal duct grows as an epithelial sprout from the free border of the eyelid, and the proximal segment from the nasolacrimal duct proper.

It seems reasonably certain from the work of Ask and van der Hoeve that if a fissure is the cause of a division of the lacrimal duct into two parts, the fissures or furrow must be a secondary one. The nasooptic furrow is obliterated before this time; indeed is in a very rudimentary state at the appearance of the very beginning of the nasolacrimal passageways (32-day embryo). The explanation for the fissure may be found in amniotic bands, and what before was mere conjecture and speculation now appears to have received strong support. Professors

van der Hoeve and Ask not only present a theory, but to-night one of them has shown illustrations from actual tissues and patients in confirmation thereof. As to the question of time raised by Professor van der Hoeve, Dr. Schaeffer's belief was that division of the ducts occurs early. Unfortunately, most of the specimens shown this evening were from monsters. This would indicate, according to the studies of Mall and Stockard, early faulty environment of the embryo. Mall also shows that the vast majority of human monsters are aborted before the sixth week. This may account for the relative infrequency in the newborn and child of the anomalous nasolacrimal ducts discussed tonight. It has been shown that pathologic embryos that survive the eighth week very frequently continue thru the normal period of pregnancy, and will be monsters at birth. Fortunately, Nature early gets rid of the majority of such undesirables. While additional studies should be made, Professor van der Hoeve's is the first plausible explanation for a certain and infrequent type of anatomic defect or variation that was unaccounted for hitherto.

Senile Changes of the Optic Nerve.

DR. ERNST FUCHS, of Vienna, First of all I beg to thank the Ophthalmological Section of the College of Physicians for the honor done me by the invitation to read a paper before you. The subject of the paper is the senile changes of the optic nerve, especially in so far as they are capable of damaging the vision. One meets now and then with cases of reduced vision in old people, either without any ophthalmoscopic changes, which could account for it, or maybe with a slight pallor of the optic disc. If this could not be attributed to some manifest cause, I used to describe it as senile atrophy and considered it as a benign form, insamuch as it never resulted in complete blindness.

In order to know what senile changes may occur in the optic nerve, I removed during the last few years in the postmortem room from the bodies of persons over 70 years old the eyeballs together with the optic nerves, the chiasm and the optic tracts, and examined them in serial sections. The senile changes found in these cases were of these classes.

1. *Amyloid Bodies.* They are very often confounded with the *arenaceous* bodies. The arenaceous bodies originate from the endothelial cells lining the arachnoid sheath of the optic nerve, and are therefore found in the intervaginal space. They exhibit a laminated structure and are many times larger than the amyloid bodies. The latter are of a homogeneous structure, and owe their name to their staining with certain stains in the same way that starch does. There is a pretty general consensus of opinion, that they develop exclusively from neuroglia, so that they are found only where the supporting tissue is formed by neuroglia, i. e., in the central nervous system. There we meet them without exception in all old persons altho in a varying degree of frequency. The optic nerve being an advanced part of the brain, they must be expected to be present also in it. Now one never finds them in that part of the optic nerve which remains with the excised eye and which is mostly the only portion of the optic nerve examined. Obersteiner, however, has shown that they are quite frequent in the intracranial portion of the nerve. There I found them sometimes in great numbers—in one case more than 1500 in each cross section of the nerve, being equally numerous also in the chiasm and in the optic tract. But at the entrance of the optic nerve into the optic canal their number decreases very suddenly, and in the orbital division but a few may be found, and then only in the posterior part of it. If they are as numerous as in this case, their entire number in the optic nerve, chiasm and optic tract together may be estimated as several millions. Now the diameter of these bodies is so great that it occupies the space of 8-13 fibers of the optic nerve, which are pushed aside by the bodies. If they are so abundant in the above case, each fiber must be dis-

placed several times by the bodies it meets on its way and may so become damaged.

2. *Sclerosis of the vessels.* This was present in a varying degree in all cases examined and was very advanced in some of them. The internal carotid artery, and, branching from it, the ophthalmic artery are seated at the inferior side of the intracranial portion of the optic nerve. These vessels are often dilated and their walls thickened or even calcified. Then they exert a pressure upon the lower side of the optic nerve, which, however, is prevented from giving way by the pressure of a very tough fold of the dura mater, which extends from the upper circumference of the posterior orifice of the optic canal backward so as to form a sort of prolongation of the canal, so preventing any upward displacement of the nerve. Therefore the pressure of the ophthalmic artery effects a flattening on the lower side of the nerve or even a depression, which in some cases becomes so deep as to divide the nerve into two separate parts, the nerve bundles between them becoming completely destroyed. This determines a loss of the nasal half of the field of vision, and if the lesion is bilateral, a binasal hemianopsia, which therefore, if it occurs in old people, is indicative of a damage done to the optic nerves by a sclerosed ophthalmic artery.

3. *Atrophic foci.* They can be recognized as such already in an early stage in sections stained by Weigert's method, in which the focus stands out by its lighter color because of the disappearance of the medullary sheaths. Later on, the axis cylinders also perish, the entire nerve bundles become smaller and smaller, and in proportion the septa between them thickens, so that in advanced cases they may coalesce. If as usually happens, the focus is located at the periphery, the nerve flattens out at the site of the atrophy. I have found such foci of atrophy in nearly all nerves examined, often two to four in one nerve. Most of the foci occur in the division of the nerve, which lies in the optic canal, or near its anterior or posterior orifice. The size of the foci varies; some may be so large as to occupy nearly one-third of the thickness of the nerve and may attain a length of 5 to 10 mm. The atrophy is always most advanced at a definite point, from which it extends upward and downward, the ascending atrophy being always 3 to 4 times longer than the descending. As to the cause of the atrophy, it could not be the disease from which the persons had died, as these diseases varied greatly in character in my cases. There was only one morbid change common to all cases, namely the arteriosclerosis, which therefore I take to be the cause of the foci of atrophy. Behind the entrance of the central artery, the nerve is supplied with blood by small arteries, which penetrate from the pial sheath into the nerve together with the connective tissue septa. These arteries are terminal vessels, so that if they are obstructed by sclerosis, the blood supply becomes insufficient. Then the delicate nerve fibers perish, whereas the more resistant connective tissue of the septa survives.

As the atrophy attacks as a rule the peripheric bundles, it ought to manifest itself by a peripheral contraction of the field of vision. This, however, may easily remain unnoticed by the patients, especially if their vision is already impaired by other changes due to old age.

Discussion.—Dr. Edward Jackson, of Denver, said: In expressing high appreciation of the address Professor Fuchs has made to us this evening, I can safely claim to speak for every one who heard him. Heretofore when an elderly patient showed deteriorating vision, without any recognizable cause for the visual impairment, we have called it "senile amblyopia," and rested quite satisfied with the diagnosis. The discovery of the corpora arenacea in the intracranial portion of the senile optic nerve, gives a new definiteness to our conception of senile failure of vision, and the starting point for additional researches as

to the etiology and possibly the prevention of such changes.

Such results of painstaking research carry the lesson which we American ophthalmologists most need to learn; that careful studies in pathologic histology still need to be made with reference to many conditions; and promise results that will revise and advance our conceptions of disease, and bring about practical modifications in prognosis and treatment.

CHARLES R. HEED, M.D.
Clerk.

ROYAL SOCIETY OF MEDICINE, LONDON.

SECTION OF OPHTHALMOLOGY.

Friday, December 9, 1921.

President, DR. JAMES TAYLOR, C.B.E.

Hyalin Bodies in Disc, with Night Blindness.

MR. MALCOLM HEPBURN showed a patient with this condition of hyalin bodies in the disc, the interesting feature being the associated night blindness. Sometimes these bodies were seen with pigmentary degeneration of the retina, but in this case there was none of the latter. Possibly there might be retinal degeneration without pigment, but in all cases of such degeneration there was a ring scotoma, and this case had not one. The fundus was of the albinotic type, and his brother, who was under the care of Mr. Treacher Collins at Moorfields, had a similar kind of fundus. The exhibitor had never yet found the symptoms of night blindness in an albino. The patient was also a myope, and true night blindness was sometimes found in myopes. The night blindness in this case he regarded as a coincidence.

Macular Mass for Diagnosis.

MR. C. LONGWORTH BLAIR showed a man with a mass at the macula, of uncertain nature and origin. For 2 1/2 years there had been difficulty in seeing with that eye.

Discussion.—MR. RAYNER BATTEN mentioned a case of his own in which there was a mass in the middle of the macular region, and it definitely followed scarlet fever and ear trouble. During the year he had been watching the case, there was no increase in the size of the mass; indeed the retina had latterly been more healthy looking. He thought it was inflammatory, also Mr. Blair's case.

MR. J. H. FISHER thought there was little evidence of inflammation, but that there was a cystic element in the case.

MR. M. S. MAYOU spoke of a case with a similar appearance he had now under care, a child aged 12, who had a good deal of keratitis punctata, and there were enlarged tubercular glands in the neck, proving the case to be inflammatory, and as such he regarded Mr. Blair's case.

Cyst of Iris.

MR. R. R. CRUISE showed a case of this nature, as to which there was no history ascertainable as to inflammation or injury. His inclination was to regard it as a retention cyst associated with crypts towards the base of the iris, the crypt mouths having become occluded by the continued secretion which was not being evacuated. There was an opacity of Descemet's membrane, giving to the limbus a greyish haze. The stroma of the iris seemed to be excavated, and the base of the cyst seemed to be formed by the posterior layer of the iris. The tension of the eye was normal, and there were no signs of synechiae. It was a flattened pupil. It was necessary to think of possible increase of tension caused by the fluid, and he invited advice as to operation. There were no fundus changes to be made out.

Discussion.—MR. W. H. MCMULLEN reminded members of a case of cyst of the iris which he showed 18 months ago, with very clear contents. There was no history of injury in that case either. The condition appeared to have dated back to infancy, when the child had a cyst removed at a hospital, and it subsequently recurred. At the

meeting referred to it, was suggested that the child might have received a puncture wound in the eye from a secreted pin in the pillow. Cases had been seen in France in men who were exposed to fragments from exploding shells. The case he referred to was still in practically the same condition. He advocated leaving these cysts alone, because of the risk of conveying the epithelial cells where they would be a danger; moreover, if the cyst was not obviously growing, it did not seem to do any harm.

Mr. M. S. Mayou thought the difficulty was that when the cyst collapsed, the edges came together again and formed a fresh cyst round the margins of the old one. In one case, the eye of which he examined in the pathologic department, operation had been done and very acute iridocyclitis followed. For this the patient did not come to hospital, and sympathetic trouble developed in the other eye, and it went quite blind. In another similar case the eye had to be removed. He agreed with Mr. McMullen that they should be left alone.

Mr. Hine mentioned a similar case of his own, in which his passive attitude received support.

Mr. J. H. Fisher objected to the impression going out that operation on these cysts was attended with danger subsequently. He thought Mr. Cruise's case was one of retention cyst, and considered that puncture promised success.

Coloboma of Optic Nerve.

Mr. J. F. Cunningham showed a patient with coloboma of the optic nerve, which he considered was traumatic. The eye was highly myopic, and there was no perception of light. No history of injury could be gleaned, however.

Discussion.—Mr. Hepburn's view was that the case was congenital. In all the cases of the kind he had seen in which there was trauma, there was a great development of fibrous tissue, and often heaped up pigmentation, features which were absent from this case.

Mr. Mayou suggested it was probably a birth injury. He did not think there was always necessarily a mass of fibrous tissue in front of the nerve after evulsion of it: certainly if the nerve head was torn out from the scleral foramen, such a fibrous mass did not necessarily occur.

Sclerosing Keratitis.

Mr. Lindsay Rea showed a case with this condition, which came on very insidiously, without any noticeable inflammation. The Wassermann test was negative, and tuberculosis did not appear to come into the picture, but she had three very bad teeth, which he considered were the cause of the trouble, and they were being removed.

Restoration of Lower Lid After Gunshot Wound.

Mr. M. W. Oliver, who is working at the Sidcup Hospital, showed an ex-officer whose lower lid was carried away and the eye destroyed by a gunshot in the war, and who was anxious to wear an artificial eye. He described by means of slides the grafting he did, and illustrated the various stages, emphasizing the importance of lining the flap.

He was congratulated on the result by the President and Mr. Goulden, the latter remarking that in a case he did he did not line the flap, not knowing its importance, and the result was quite satisfactory notwithstanding.

Motais Operation for Congenital Ptosis.

Mr. R. Affleck Greeves showed a patient on whom he had performed a Motais operation for congenital ptosis; he intended doing the same for the other eye. He was complimented on the result by the President and Mr. Cruise, the latter referring to a similar case in which he did the operation, with excellent results. He remarked on the successful closure of the eye during sleep, despite the fact that the innervation of the muscle pulling the eye upwards was the same as for that which pulled the lid upwards, the orbicularis obviously overcoming the action of the other.

H. Dickinson.

COLORADO OPHTHALMOLOGICAL SOCIETY.

December 17, 1921.

F. E. WALLACE, presiding.

Hemorrhage Into the Vitreous. Tuberculosis of the Retinal Vessels.

J. A. McCAW, Denver, presented a man aged forty years, a photographer by occupation, who while attending the theater on October 15, 1921, had noticed loss of vision in the right eye. When the patient was seen at Dr. McCaw's office the next day, the vision of the affected eye was 1/200. Along the branch of the central artery which passed above the macular region, were several small hemorrhages. Of these the one nearest the disc was old, the others recent. No subsequent hemorrhage occurred for about ten days, and the vision improved in the lower temporal field. Toward the end of the second week, the patient returned with practically no vision in the right eye, and examination showed a massive hemorrhage into the vitreous. The patient stated that he had taken thirty drops of adrenalin chlorid daily until two bottles had been used.

Discussion.—J. M. SHIELDS and C. E. WALKER, Denver, emphasized the necessity for absolutely thoro investigation of causation.

H. R. STILWILL, Denver, had seen a case of vitreous hemorrhage in a man of forty years, in which the result of every line of investigation was absolutely negative.

W. F. MATSON, Denver. It is not necessary to have high blood pressure to get vitreous hemorrhage. My blood pressure has never been over 125 mm. of mercury, and I have had a hemorrhage into the vitreous of the left eye.

W. C. FINNOFF, Denver. Judging by the literature this is an uncommon disease, but in reality it is not so. I have only been practicing ophthalmology about seven years, and I have seen sixteen cases, seven of them my own. It is unusual for the patient to be of the age of Dr. McCaw's case. Formerly I supported the view that cases of recurrent hemorrhage into the vitreous were likely to be tuberculous if one could not find another cause. But if the tuberculin which we use is of any value diagnostically, I have recently had three cases which I have proved not to be due to tuberculosis. In these cases, if a reaction from tuberculin is obtained, it appears in the eye in the form of perivasculitis which is characteristic of tuberculous disease of the bloodvessels. I assured two of my patients that they undoubtedly had tuberculosis of the retinal vessels, and to prove this I used tuberculin, but we ran up to five mg. of old tuberculin without any reaction whatever. On getting back from the meeting of the American Ophthalmological Society, I had another case of massive hemorrhage into the vitreous which endured a series of tuberculin tests without reaction. So Dr. McCaw's diagnosis of idiopathic hemorrhage will stand for the present. We do not know more about these cases because we never get an opportunity to study them microscopically during the active stage. In applying the tuberculin test to these cases, it is advisable to wait until the hemorrhage is completely absorbed, so that we may have a satisfactory opportunity to study the vascular changes in the fundus. Recurrent hemorrhage into the retina and vitreous in young persons is probably not a specific disease. Tuberculosis of the retinal vessels and especially of the veins is one of the etiologic factors. One thing it is important to remember. The detailed changes of retinal vascular tuberculosis are usually to be found toward the periphery of the fundus, and careful study of them requires hours rather than minutes.

Chondroma at Orbital Margin.

W. C. and W. M. BANE, Denver, presented a woman aged forty years who had come September 22, 1921, complaining of congestion near the inner canthus of the left eye, accompanied by an aching and drawing sensation in that area. The disturbance had been noticed for about four weeks. There was no loss of vision. Below the left caruncle, and elevating it and

the adjacent tissues, was a round growth which to the touch was about the size of a pea. On November 8 the growth seemed to have doubled its size. It was hard and immovable. Inspection of the left side of the nose revealed a mass springing from the cartilaginous septum, one inch from its anterior edge. The mass reached across the nasal cavity, and was inseparable from the outer nasal wall. It measured vertically about three-fourths of an inch and was covered by a smooth mucous membrane. There was a fairly good air passage above and below. A probable diagnosis of enchondroma of the nasal septum was made, and an operation was performed thru the nostril on November 14. An incision was made in the mucous membrane close to the septum, and the mucosa stripped away from the tumor, which was found to be white and quite soft. The visible mass was easily shelled out, and upon firm pressure over the growth at the inner canthus, a good deal more cartilaginous material was brought down and removed thru the nose. On subsequent exploration it was found that the middle turbinate bone, all of the anterior ethmoid cells, and the wall of the orbit posterior to the lacrimal bone had been perforated by the tumor. A probe was easily passed from the nose into the orbit. Pathologic examination by Dr. Stahl showed pure enchondroma. The results so far had been perfect.

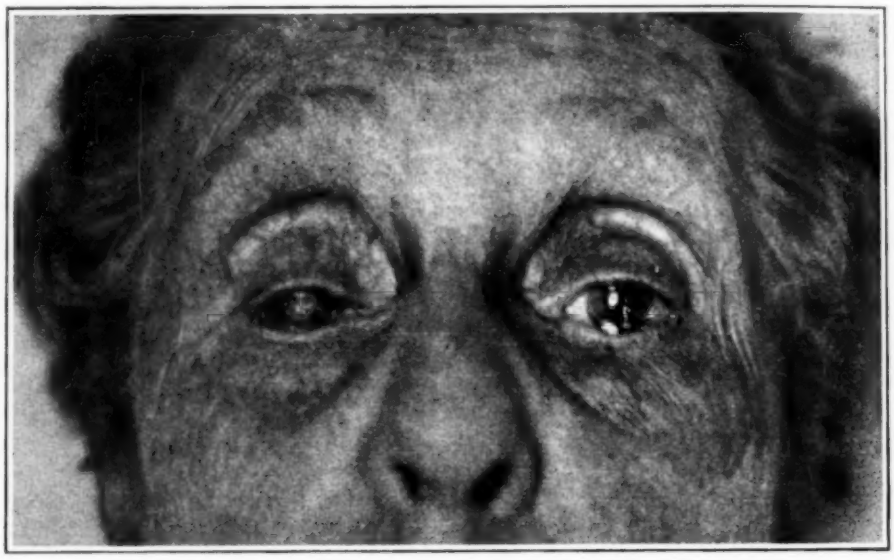


Fig. 1.—Case of ocular pemphigus reported by W. C. Bane after 14 years.

Extreme Changes in Optic Nerve of Child; Avulsion?

W. C. and W. M. BANE, Denver, presented a boy aged ten years, whose mother gave the history that the boy's left eye had had defective vision since infancy. She could suggest no cause except possibly a fall from a buggy when the child was two years of age. The vision of the right eye was 5/5, of the left eye 5/60. The pupils were equal, but the left one reacted more slowly to light than the right. The right fundus was normal. The left fundus showed very marked changes of long duration involving the optic nerve and its immediate vicinity. The disc was elevated about three diopters. The disc margins were concealed, and the bloodvessels tortuous and atrophic, some of them being twisted like corkscrews. Covering the disc and in its immediate vicinity, there was evidently a large amount of fibrous tissue, by which some of the bloodvessels were partially covered. The vision of this eye was improved to 5/30 with correction of two diopters of astigmatism.

Discussion.—C. E. WALKER, Denver. had seen two somewhat similar cases, one in a boy, and another in an older person, with regard to whom a congenital origin was assumed for the eye condition. In Dr. Bane's case the condition was probably congenital.

W. H. CRISP, Denver, suggested that the appearance of the disc could be satisfactorily explained by supposing that a partial avulsion of the optic nerve had occurred at the time of the buggy accident referred to by the mother.

Ocular Pemphigus. (See photograph.)

W. C. and W. M. BANE, Denver, presented a woman aged sixty-eight years, who had been brought before the society several times during the past fourteen years. When first shown she was suffering from pemphigus of the left eye. Contraction of the lower cul de sac of this eye had been treated by transplanting a strip of ocular conjunctiva into the sac, and later by X-ray applications, and in this eye the disease had remained in check. Seven years later, in 1914, the right eye had become affected. From time to time ulcers of the ocular and palpebral conjunctiva had developed, and these had not been benefitted by X-ray treatments. At the present time, there was a narrowing of the palpebral aperture of the right eye, and the upper and lower eyelids were strongly adherent to the eyeball. The epithelial layer of the cornea was very much thickened, rough, dry, and opaque. The cornea was insensitive. The patient suffered no pain. The vision of the right eye was good light perception and projection. The left eye had retained corrected vision of 20/20 minus 3.

Multiple Retinal Hemorrhages.

F. L. BECK for G. L. STRADER, Cheyenne, Wyoming, presented a man aged twenty-eight years, who on November 21, 1921, had come complaining of a haze before the right eye which had existed for a month. The vision of this eye was 20/30—. With the ophthalmoscope several punctate retinal hemorrhages were found upward and outward from the nerve head, and one large flame shaped hemorrhage below the nerve. Some of the bloodvessels were very tortuous. There was no clinical history of lues, and a Wassermann was negative. A skiagraph of the teeth showed an apical abscess on the upper right second bicuspid, which was therefore extracted. On November 30 the hemorrhages were fairly well absorbed, and old linear scars could be seen in the retina upward and outward from the optic disc. At this examination the patient stated that he had had an attack of blurring eight or ten months previously. On December 10 the vitreous contained several large floaters and was clouded with dustlike opacities; and the vision was the same as on November 21.

Discussion.—W. C. FINNOFF, Denver. Toward the periphery, to the upper nasal side of the right fundus, there are pearly white strands of retinitis proliferans, and some probable patches of retinal detachment.

Dr. Beck remarked that Dr. Strader had especially commented upon the rapid changes in this man's eye, that is the absorption, in the course of nine or ten days, of the hemorrhage below the nerve.

Penetrating Injury from Piece of Steel. Shrinking Eyeball.

F. L. BECK, for G. L. STRADER, Cheyenne, Wyoming, presented a man aged thirty-eight years who on October 27, 1921, while driving one spike maul with another, had received a splinter of steel in the right eye. The fragment had produced an irregular wound about three-sixteenths of an inch long near the inner corneal margin. The lens was opaque, and the pupillary margin of the iris had the appearance of having been nicked by the foreign body in passing. By X-ray the foreign body was located in the temporal side of the globe just back of the ciliary body. On October 29, an attempt was made with a giant magnet to remove the foreign body thru the pupil. The fragment caught in the iris, and had to be removed thru a scleral incision about five or six mm. outside the corneal margin. The fragment measured two by six mm. The wound had been

covered with a conjunctival flap. The eye had run a rather stormy course for about two weeks, and for the past month had done very well except that it did not clear up. Light perception and projection were fair but were diminishing. Ten days before the date of report, the tension of the eye had been 15 mm. of mercury, and the eye had become perceptibly smaller. Should this eye be removed as a possible source of sympathetic ophthalmia?

Discussion.—C. E. WALKER, Denver: In those cases in which the lens is injured by a piece of steel entering the eye and the eye does not quiet down quickly, I believe the cataractous lens has a good deal to do with the development of iridocyclitis. This calls for early attention. Either the lens should be removed, or, where the eye refuses to quiet down and the sight is lost, enucleation should be done.

DR. BECK. The man has objected seriously to enucleation because he has light perception.

Progressive Loss of Vision. Negative Findings.

W. F. MATSON, Denver, presented a man aged twenty-one years, a stationary engineer by occupation, who from about the middle of November, 1921, had noticed progressively hazy vision, until on December 5 both eyes had become blind. He complained of a pulsating pain in each eye, with headache, nausea, and vomiting. The pupils had been dilated on December 8, and therefore yielded no information when Dr. Matson first saw the patient on December 11, but at the time of report, altho still fairly well dilated, a slight reaction to light was noticeable. Neither fundus had shown any change. Negative results were obtained thruout from X-ray examination of the teeth, nasal sinuses, and cranium, from a Wassermann test, and from a careful examination of the nervous system. On December 11 the right eye had no light perception, while the left eye had vision of the hand at twelve inches. There was no paralysis of the extrinsic muscles. The patient stated that he had been a steady drinker of "moonshine" liquor, but after he drank a certain amount of it he became nauseated and vomited.

Discussion.—F. R. SPENCER, Boulder, thought that the case looked like one of wood alcohol poisoning. The right disc seemed quite pale, and some of the vessels decidedly narrow.

W. C. FINNOFF, Denver. We must not jump to conclusions in this case. The patient's companions have been drinking the same liquor right along and are apparently unaffected. The discs do not seem to me to be white, in fact the left one appeared rather to be slightly red and the veins a little larger than normal. I should be inclined to urge opening the sphenoids and posterior ethmoids, even tho the the nasal findings are negative. There is nothing to lose by so doing.

W. A. SEDWICK, Denver, called attention to a floating body, which had been seen by several of the members, in the right vitreous at some distance below and in front of the disc; but which probably had no connection with the blindness.

Persistent Hyaloid Artery.

W. A. SEDWICK, Denver, presented a young woman whose right eye contained a blind but pulsating arterial stem projecting forward about three diopters from the optic disc, making several spiral turns, and about equal in diameter to one of the primary branches of the retinal artery. The vessel was taken to be a persistent hyaloid artery.

Glaucoma.

F. R. SPENCER and C. L. LARUE, Boulder, presented a woman aged sixty-eight years whose left eye had become completely blind and the vision of whose right eye was considerably reduced, the condition in each eye being glaucoma simplex. The trouble was thought by the patient to have started about two years previously as the result of worry following the death of her husband. The corrected vision of the right eye in September, 1920, had been 5/7.5—2; of the left eye light perception with faulty projection. At that time the tension was R. plus 2, L. slightly higher. There was a slight

nuclear opacity in each lens. The right optic disc presented a deep, possibly physiologic cup, and there was glaucomatous cupping on the left side.

Various examinations were negative except for the presence of moderate arteriosclerosis and poor general condition. In October, 1920, she had returned to her home in Iowa, where she had failed to obtain treatment other than the use of eserin, which had been begun in Boulder. At her return on December 10, 1921, the vision was R. 6/10—1, L. nil. The tension with the Schiötz-Gradle tonometer was R. 42 mm., of mercury, L. 52 mm. An operation upon the right and possibly also upon the left eye was contemplated.

Discussion.—W. C. BANE, Denver, referred to the fact that thyroid extract had been recommended in these cases, simultaneously with eserin. He had seen apparent benefit from its use in one case.

C. E. WALKER, Denver. The only treatment likely to be effective is an operation of some kind. I should favor a combination of preliminary posterior scleral puncture with an immediately following section by the Lang knife, for the purpose of obtaining a cystoid scar. This may be accompanied by an iridectomy.

W. H. CRISP, Denver, thought iridectomy the best operation for the case, and that the responsibility for doing such an operation should be promptly faced, altho in such a case there was always a risk that the vision might fail more rapidly after an operation than without it.

Brain Tumor.

E. E. MCKEOWN, Denver, presented a man aged about twenty-eight years who was probably suffering from brain tumor. For the past eight years he had had epileptic attacks. About four months previously he had been struck on the top of the head by a piece of timber. The blow did not render him unconscious. A short time later he began to have pain in the head with intermittent headaches, which had later become practically continuous. The headache was not localized, was just as bad on getting up in the morning as in the afternoon, and quite frequently awoke him during the night. A traveling optician had given him a solution of atropin, which he had used for a month. The vision of the right eye was counting fingers at four feet, of the left eye 16/50, not improved by any lens. In each eye there was a choked disc of three or four diopters, and there were small hemorrhages toward the edge of each disc, but none in the periphery of the fundus. Retinoscopic examination indicated a high hyperopia in the right eye, and emmetropia in the left. The nasal accessory sinuses had been suspected and opened, but without benefit. The Wassermann test was negative in blood and spinal fluid. A neurologist who had examined the patient felt positive that he had a tumor on the right side of the brain.

Discussion.—W. C. BANE, Denver. From the history and the appearance of the fundus, my impression is that this man has a tumor of the brain.

W. C. FINNOFF, Denver. The patient should be watched by a neurologist, and a trephining considered.

W. A. SEDWICK, Denver. Notwithstanding the negative Wassermann test, I would put the man on 606.

DR. MCKEOWN had hesitated to do this because of the possibility of arsenic affecting the optic nerve.

F. R. SPENCER, Boulder. I cannot see any object in giving 606, except to be doing something.

W. H. CRISP,
Secretary.

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

December 19, 1921.

DR. HILLIARD WOOD, President

Enucleation of Eye and Implantation of Glass Sphere in Tenon's Capsule.

DR. HILLIARD WOOD: W. M. C., male, white, aet. 49. In 1915 cataract was present and its removal advised; op-

eration declined. Nov. 17, 1921, eye developed pain. Four days later examination showed marked vascular injection about the front of the eyeball, with irritative symptoms; hyphema filling the lower half of the anterior chamber. Upper half of pupil seen above region of the blood. Tenderness of the ciliary region. T.—48 mm. Hg. Ears, nose and sinuses negative. Faucial tonsils septic. Patient wears upper dental plate. Few remaining lower teeth suspicious. Blood pressure 130-80. A diagnosis of acute iridocyclitis with secondary glaucoma was made. Treatment: a solution of eserin and pilocarpin in the eye, and salicylat of soda internally. Tonsillectomy advised, but declined. Nov. 23—fresh hemorrhage. Anterior chamber full of blood; upper half of blood bright red, lower half dark red. Vision zero. Continued pain. Nov. 25—enucleation, and a glass sphere 20 mm. in diameter placed in Tenon's capsule. Catgut suture. After three and one-half weeks, wound has healed.

Discussion.—Dr. Fred E. Hasty pointed out that the two most important features in this technic are the choice of suture material and the danger of infection. While catgut might be used to a certain extent, it has been his custom to use silk, especially in the muscles. If infection should develop, this operation will almost certainly be a failure, as inflammatory reaction will set up, and the sphere work its way out.

Dr. J. Leslie Bryan inquired as to the advantage of glass sphere over fat implantation. Dr. Hasty's objection was that in practically all cases the fat would, in the course of time, be absorbed.

Dr. E. B. Cayce referred to a recent article by Dr. Stanford in which the writer reported fourteen cases done according to the Greenwood technic, with only one extrusion, that being a case in which catgut was used. He also referred to his personal experience in three cases of gold ball implantation, in which catgut was used, and every one of which came out. Since that time he has not attempted this technic until quite recently, when he implanted a glass sphere in Tenon's capsule. He remembers that Dr. Graddy used black silk in four cases of gold ball implantation, but personally he prefers the white silk. Black silk, however, would be an advantage in case the sutures should need removal. After all has been said and done, glass is probably more satisfactory than any other foreign substance. He referred, however, to two very successful cases of fat implantation which had come under his obesrvation, one a case presented recently by Dr. Hubbard, and one done by Dr. Graddy some twenty years ago. In the latter case the cosmetic effect is especially good.

Dr. Robert Sullivan suggested the use of silk, regardless of the color, in closing Tenon's capsule and muscles; then there is no objection to sterile catgut for making the conjunctival closure. Regarding the implantation of fat, there is no objection except that the fat does absorb within a few years. He made a plea for more effort in obtaining better cosmetic results, stating that patients are entitled to better results than they have been getting.

Bulging of Filtration Bleb Following Iridotasis.

Dr. Herschel C. Ezell presented Mrs. L. R. S. aet. 64, first consulted him January 5, 1921, giving a history of impaired vision in the left eye for many years, and sudden blindness developing in the right eye four weeks previously. Examination showed the vision of the right eye to be P. L. Left eye V.=20/200; with +0.50 D. S. ⊃+1.00 D. c. Ax. 90° V. =20/50 Cupping of each optic disc. Each anterior chamber shallow; pupils dilated; tension increased on palpation; right field could not be taken; left field contracted. Diagnosis: Glaucoma simplex. January 9th, did double iridotasis, with good result. Dec. 6, 1921, patient returned complaining of slight tenderness in left eye. Examination showed good filtration bleb in the right eye, but in left eye there was marked bulging of the filtration bleb, including

the iris tissue. The vision and field of the left eye the same as on Jan. 5th, previous to operation.

Discussion.—Dr. J. J. Frey reported that he had had a similar case in which he had simply punctured the bleb and let the fluid out, with good result.

Dr. Robert Sullivan spoke of the danger of rupture of the bleb and resulting infection, stating that in its present condition the eye would be hopelessly lost if an acute infection should develop. He suggested that a small conjunctival flap be made and pulled over the bleb to protect it.

Dr. Hasty said that in cutting off the bleb and pulling the conjunctival flap over, one should be careful to do this in such a way as to give the flap a raw surface to which to anchor; otherwise the flap will slip.

Thrombosis of Central Vein of Retina.

Dr. E. B. Cayce presented Miss E. C. aet. 40; came to his office December 5th, with the following history: Was reading yesterday afternoon and vision became suddenly dim in right eye; no pain; no other discomfort. On examination found a typical picture of thrombosis of the central vein of the retina. When first seen, retina showed white spot near center of the nerve head, with numerous hemorrhages all over fundus, especially in the lower temporal portion of field. Arteries could not be made out, and there was a slight area of swelling in the nerve head which gave the appearance of choked disc. X-ray of ethmoids and sphenoids showed negative findings. December 15th, appearance of nerve head gave the impression of a typical choked disc. Vision in eye was fingers at twelve inches. General examination showed pyelitis and albuminuria.

PITTSBURGH OPHTHALMOLOGICAL SOCIETY.

December—January.

Dr. E. B. Heckel, President.

Intraocular Foreign Body.

Dr. Edward A. Weisser reported the following case of intraocular foreign body. Mr. C. B., age 31, was chipping at bearings, Oct. 7, 1921. The foreign body entered the cornea, cutting the iris at the same time, passed thru the lens, and an X-ray showed it to be located in the vitreous, 12 mm. back of the center of the cornea, 1 mm. above horizontal meridian, and 4 mm. to nasal side of vertical meridian. The magnet was applied, but no response elicited. On Oct. 29th, a peculiar looking object of some kind was noticed lying on the iris. X-ray made next day showed the foreign body 3 mm. back of center of cornea, 4 mm. above horizontal meridian and 2 mm. to nasal side of vertical meridian. The next day an opening was made in the cornea with a keratome and magnet applied without response. The foreign body had moved from the vitreous into the anterior chamber, in front of the iris. The patient now thinks foreign body is babbitt metal which is, of course, nonmagnetic. The foreign body has attached itself to the iris behind, where it is thought safe to allow it to remain, as the eye is quiet. The lens is entirely cataractous and there are broad posterior synechiae. The lens will be extracted later.

In *discussion*, the consensus of opinion was that the foreign body should be removed. Dr. Stieren thought the first radiogram faulty and that the foreign body had been hidden by exudate. Dr. Curry thought that there might be two foreign bodies in the eye. Dr. Heckel believed there was a mistake in localization. He advocated immediate removal of the foreign body. By instilling eserin to put the iris on the stretch, he thought the metal could be lifted from the iris without tearing it; if not, a small iridectomy should be done.

"Invaginating" Capsular Cataract.

Dr. Edward Stieren reported a case of what he termed "Invaginating" capsular cataract. The patient is a 50 year old man, with vision of 1/40 in the right eye and hand movements at two feet in the left eye. The left eye is much more prominent than the right and converges. This eye was injured in infancy by a cow's horn. The exterior of the right eye is normal and the pupil dilates readily and fully under homatropin. With the ophthal-

moscope and by direct illumination, the anterior capsule is completely opaque with the exception of the outer upper one-fifth of the lens. The posterior capsule is similarly affected, except to a greater extent, the opaque capsule covering practically six-sevenths of the posterior lens surface. Atropin and dionin have been used persistently for the past six months without any appreciable benefit, except that vision is slightly better, due to the enlarged pupil. The left eye has about 26 D. myopia.

Discussion.—Dr. Stieren asked the question whether the patient should be subjected to the risk of operation upon his one useful eye, which permits him to follow his occupation with present reduced vision. Drs. Heckel and Smith answered in the negative. Dr. Weisser proposed a preliminary iridectomy.

Orbital Tumor.

Dr. Edward B. Heckel exhibited a case of orbital tumor in an adult male which was being reduced by X-ray treatment. Dr. Stieren stated that from palpation of the mass he believed the tumor to have arisen from the upper inner wall of the orbit. He advised X-ray pictures for diagnosis and urged an exploratory operation inasmuch as the nature of the tumor is uncertain.

Congenital Stenosis of Nasolacrimal Duct.

Dr. J. B. McMurray reported two cases of congenital stenosis of the nasolacrimal duct, with spontaneous recovery. Both cases had only one eye involved. Condition began when patients were two and three weeks old, respectively, with epiphora, which was incessant and which turned into mucopurulent secretion following an acute inflammatory attack that subsided under antiphlogistic treatment. One of the cases was under observation for two and one-half years, and the other for three years. Operative interference for the removal of the obstruction, which was evident, was deferred until patient was old enough to have the nasolacrimal duct dilated. Treatment in the meantime was expression of the contents twice daily and the instillation of argyrol in the eye.

The parents were advised in both cases that the infants were old enough to have the operation, but before operation could be done, both ducts opened spontaneously and complete cure resulted. All evidence of lacrimal obstruction had ceased and the patients are entirely well after three years. The reason for reporting these cases is to raise the question as to how often spontaneous opening of the lacrimal ducts occur and how long one should wait for such spontaneous opening.

A third case occurred in a child one and one-half years old, with a history of having had trouble in the eye since three weeks of age. The mother was sure that nothing came from the eye at that time except tears, followed in about three months with some soreness alongside the nose. When the child was examined, there was a swelling over the lacrimal sac. Pressure expressed a large quantity of mucopurulent material. The culture contained no growth of importance. The child was treated for six months in the belief that the duct might open spontaneously. Meanwhile, the family physician reported that the child had had an acute conjunctivitis during the first weeks of its life, which he thought was mild ophthalmia neonatorum. On account of this history, immediate operation was done, with complete relief of all symptoms of obstruction.

Discussion.—Dr. E. Stieren stated that he probes under chloroform anesthesia after three or four weeks of expression, using No. 1 or No. 2 Theobald probes, with gratifying response.

Dr. Krebs probes early, under general anesthesia, syringing the duct first and using No. 3 or No. 4 Bowman's probes. He finds it necessary to probe only once.

Dr. Smith reported one case which got well spontaneously.

Drs. Jobson and Curry advocate persistent washing out of the sac with a weak solution of zinc sulphat.

DR. HECKEL expressed the secretion from the sac, but does not probe in this condition, which he prefers to call dacryocystitic blennorrhea. He limits the use of the term dacrocystitis to the acute process, which is really an abscess of the sac.

Enucleation in Infants.

DR. EDWARD B. HECKEL reported three cases of enucleation in infants for intraocular tumors. In infants, he does an external canthotomy to facilitate expression of the globe. He does not favor implantation operations and does not believe that it makes any difference in the development of the orbit whether or not implantation is done.

DR. STIEREN stated that he believes that it makes a difference in the development of the orbit whether or not a prosthesis is worn.

Vitreous Hemorrhage at Menstruation.

DR. WM. C. MEANOR reported that the case of married woman, age 33, in whom hemorrhage of the vitreous occurs at every menstrual period. The hemorrhage usually begins on the second day of menstruation. The vitreous becomes so cloudy that the fundus cannot be seen, but clears up before the next period. Patient has had blurred vision during her periods ever since menstruation began.

She is the mother of two children and had the hemorrhage every month during her pregnancies. There has been no epistaxis. Blood Wassermann and other tests and examinations have been negative.

Discussion.—DR. VAN KIRK had a woman of 25 who had acute edema of the eyelids and cheeks lasting three or four days at every period. Also a woman of 35 who developed two or three blebs on the eyelid when she began to menstruate; these cleared up by cocainizing the genital area of the turbinates in the nose.

DR. HECKEL had a woman with edema of the conjunctiva and lids which occurred at irregular intervals; the condition was perhaps the result of sexual excitement.

DR. MEANOR had a case of sarcoma of the iris which had hemorrhage into the anterior chamber at every menstrual period.

Herpes Zoster Ophthalmicus With Ophthalmoplegia Totalis.

DR. H. H. TURNER reported a case in a retired mine foreman, age 77. On Nov. 14th, 1921, he contracted a "cold" with development of intense neuralgic pain over the right side of the head. Several days later he developed a well marked herpes zoster opthalmicus. He was admitted to the Mercy Hospital on Nov. 24th on Dr. G. C. Weil's service. We found, in addition to the classical skin lesion, a complete paralysis of the third, fourth and sixth cranial nerves on the right side, an ophthalmoplegia totalis. The cornea was anesthetic, but showed no tissue involvement; intraocular tension normal; the conjunctiva was hyperplastic. Senile cataract made examination of the fundus impossible.

Patient has been quite delirious at times, altho since passing the acute stage the temperature curve has not gone above 100°. The paralysis of the ocular muscles is rapidly passing, but, within the past few days, there has developed at the limbus below and extending upward into the cornea an area of deep infiltration without much inflammatory reaction or pain. The case is unusual on account of the associated ophthalmoplegia totalis.

G. H. SHUMAN, Secretary.

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

December 13, 1921.

Injury from Bird Shot.

DR. E. C. ELLETT presented the case of S. J., aged 22, injured in the face and body, December 6, 1921.

Right eye. Wound at limbus at 4 o'clock, with large iris prolapse.

Iridodialysis down. No vision. No reflex. Tension reduced. Left eye. Small amount of blood in a. c. Conjunctiva red.

Perforation of lower lid in outer third. Fundus dimly seen, vitreous

opacities. Tension normal. X-ray, first reading showed no f. b. in R. orbit, and one at apex of L. orbit. Further study of the plates showed a shot in R. orbit, 32 mm. behind cornea. A thru and thru wound was therefore probable. Treatment. Rest in bed and atropin. The prolapse was excised O. D. and the limbal wound covered with a conjunctival flap. Stitches removed Dec. 12th. The eyes have cleared and vision is better in O.S. O.D. is still blind. For 48 hours he was unable to pass urine voluntarily.

Iridectomy for Glaucoma.

DR. ELLETT reported the case of a woman under observation for 12 years. Has had much poor health, including two strokes of paralysis, an abdominal operation and uremia. Vision was normal with glasses until April 1915, when she had an acute glaucoma O.S. Under local anesthesia and morphin, an iridectomy was done on April 17, 1915. In one month the vision was 20/20 with glasses, and now after 6 1/2 years the eye is absolutely well, with normal eyeground, vision and tension.

Discussion—DR. W. L. SIMPSON said that this is a beautiful result, showing the difference between acute and chronic glaucoma.

DR. A. C. LEWIS said that it would be interesting to know the etiology in this case.

DR. E. C. ELLETT said we might think that this condition would be due to the condition of the body fluids, altho the other eye is normal. The patient had an acute uremia.

Zonular Cataract.

DR. E. C. ELLETT reported the case of Miss T., aged 29. Always had poor vision. With glasses she now sees 20/100 O.D., and 20/200 O.S. Both eyes show zonular cataracts. On Dec. 8th a free V-shaped discission was done on the left eye, and on Dec. 12th a simple linear extraction removing nearly all of the lens substance.

Discussion.—DR. J. B. STANFORD asked if there is a history of cataracts in the family.

DR. D. H. ANTHONY said that this is a very good result on account of no scarring of the cornea.

Glass Ball Implanted in Tenon's Capsule.

DR. E. C. ELLETT performed this operation on H. M., aged 21, who was hurt the last of September by being struck over the left eye. When seen on November 8th, there was ciliary injection, a very deep anterior chamber, and the pupil was oval, long axis about 45°. The tension was reduced and the vitreous apparently filled with blood. The eye was enucleated on November 11th, and a glass ball implanted in Tenon's capsule. The muscles were not sutured, but a purse string suture of catgut put in the capsule, and the conjunctiva sutured separately. The ball is retained very well. The eye showed a rupture of the sclera under the external rectus muscle. There was no indication that this had occurred, but this is the usual site for a rupture of the globe from a blow.

Discussion.—DR. J. B. STANFORD said this result was as good as could be gotten by suturing the tendons. It is being done in the Mass. General Hospital. He has had one case in which he used catgut, but the sutures came loose.

DR. HUGHES asked about the size of the glass ball.

DR. W. L. SIMPSON thinks that silk is better as suturing material, as he has gotten better results from using silk in fat transplants.

DR. H. D. ANTHONY thinks ten days chromic catgut should be used, but that tying too tight will cause the sutures to cut thru the tissue.

S. S. EVANS, Secretary.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

December 12, 1921.

DR. E. K. FINDLAY, President.

Keratosis at the Limbus.

DR. ROBERT VON DER HEYDT: Mr. A. P. J., aged 62, farmer; left eye; first seen in March, 1921. The patient stated that the new growth had existed for six months. On inspection a triangular zone at the external limbus presented the appearance of xerosis. On examination with the corneal microscope, it

was seen to consist of a hyperemic zone surrounding a pale white flat triangular area. This latter was composed of smooth glistening round elevations. Many of these presented in their centers a deep seated whorl of blood vessels. On account of the possibility of this new growth being an epithelioma he showed it to Dr. Oliver Ormsby who without hesitation pronounced it a keratosis (leucoplakia). He stated, however, that this was the first instance where he had seen a change of this nature at this location.

On examination of the literature he found that neither Graefe-Saemisch nor Parsons had described this condition. In the new literature of the past ten years he found two exactly similar cases described, one by Boronici in the Annali di Oftalmologia, 1910, in a two-year old boy, the other by Komoto in the Klin. Monatsbl. f. Augenheilk, 1909. The latter was in a man, 33 years old. It was examined microscopically and the diagnosis of keratosis verified.

In the case shown to-night there had been but a slight increase in size in the nine months during which time he had had it under observation.

Medullated Nerve Fibers.

Dr. George F. Suker presented a case showing medullated nerve fibers in the right eye, so extensive that nine-tenths of the nerve head was involved. The massive leashes of medullated fibers extended well into the periphery of the fundus above and below. The vision was 20/40 and could not be improved with lenses. The blind spot was enlarged downward. The form and color fields were normal. The left eye was negative and vision normal.

Compensation for Ocular Injuries.

Discussion on this subject was introduced by Dr. Frank Allport who was followed by Dr. H. W. Woodruff. Dr. Nelson M. Black of Milwaukee called attention to the preliminary report of the Committee of the Section on Ophthalmology of the A. M. A., which was taken up and discussed by Drs. Black, Brawley, Blue, Brown, Gradle, Wilder, Beck, and Allport.

Dr. Von der Heydt, Cor. Sec.

SPECIAL REPORT

THREE WEEKS OF OPHTHALMIC MEDICINE AND SURGERY IN PHILADELPHIA WITH REPORT OF A CLINIC.

L. Webster Fox, M.D.

PHILADELPHIA, PA.

During three weeks of October the Quaker City has been living up to the full meaning of its name—the City of Brotherly Love. It was the Mecca for a stream of physicians and surgeons who brought with them skill and intellectuality; and we, of Philadelphia, dispensed hospitality, all of which have not been surpassed for many years. It was truly "Pleasure Valley" and physicians and surgeons were as plentiful as the "Leaves of the Valambrosa."

First, we had the State Medical Society and as the section of ophthalmology is always a very active one, many interesting papers were read and discussed.

This meeting was followed by the Academy of Ophthalmology and Oto-Laryngology. The brilliancy of this meeting was illuminated by the presence of Prof. J. van der Hoeve, of Leyden, Holland, and Prof. Fuchs, of Vienna, the Nestor of Ophthalmology.

To many members of the Academy the name of Fuchs was a legend, and to have had the double pleasure of not only seeing him, but also to have had the privilege of listening to his lectures at the College of Physicians was an event many ophthalmic surgeons hardly hoped ever to enjoy.

One of the outstanding features of this meeting was the intensive post-

graduate lectures given by distinguished teachers representing different Colleges in the United States and our two visiting surgeons from Vienna and Leyden respectively, all of who were Masters of their different subjects. This popular departure gives a prestige to the Academy which makes it the leading ophthalmic society in North America. The papers read, and the discussions following them, were of the best type, and many interesting facts were brought out in the papers. The lectures of Prof. van der Hoeve were delightful as well as educational, and we hope that we may have the honor of hearing him again in the near future.

These two meetings were followed by that of the "Clinical Congress of American College of Surgeons." We have had many fine surgical meetings in our city, but this event surpassed them all—seven hundred and twenty new members were installed in an academic atmosphere, the cap and gown being worn—this carried us back to the pre-Victorian age—"Glory to the Glorious."

The writer gave six special clinics, covering a wide range of surgical cases. The last clinic was given on Friday, October 28th, when cases rather out of the ordinary were operated upon. The writer feels that a great honor was conferred upon him by the presence of so many distinguished surgeons. If it gave the audience as much pleasure at it did the writer, the six clinic days were not spent together in vain.

CLINIC.

CASE 1. *Luxated cataractous lens* in the left eye of an adult man, presumably traumatic in origin was presented for extraction. The eye had been prepared in the usual manner and anesthetized with cocain solution. After irrigating the cul de sac with a 1 to 4000 bichlorid of mercury solution, the eye speculum was introduced and an incision was made in the cornea with a Graefe knife. As the incision progressed the lens proved to be luxated, and a bead of vitreous followed the removal of the knife as the incision was completed. The character of the vitreous bead showed that its consistency was softer than normal. The eye speculum was then gently removed and the eye covered with the upper lid. After a few moments of repose, a lid retractor was introduced to hold up the upper lid and given to an assistant to hold. A modified Smith operation followed. The broad flat curved spatula was introduced into the corneal wound immediately behind and in close contact with the posterior surface of the lens. Gentle pressure was then exercised on the lower part of the cornea by the fingers of the other hand. The lens quickly emerged without any further loss of vitreous, and there was no debris in the pupillary area. Nov. 6, the patient was discharged from the hospital with good vision.

CASE 2.—A small child, with *congenital cataract* in both eyes, in which the nucleus of each lens was opaque and the periphery clear. It was presumed that the nucleus was calcareous and would not admit of a successful needling for that reason. In consequence a *horizontal iridectomy* was performed on each eye at the nasal side to afford an artificial pupil. The value of this over the wearing of heavy lenses was stressed by the operator.

CASE 3. *Congenital cataract* in child 9-months old, in which both lenses were completely opaque was presented for the *needling* operation. This child was one of a pair of *twins*, both having congenital cataract. After the usual preparation and irrigation, the eye speculum was introduced. The globe was held by fixation, and the discission needle was introduced a trifle below the horizontal meridian of the cornea to the outer side and quickly thrust thru it into the lens. The needle was then further thrust thru the lens for its entire depth completely bisecting it in its principal diameters, thus dividing it into four sections. On the completion of this procedure the anterior portion was found floating freely in the anterior chamber. The needle was then *slowly withdrawn*, a word of caution being given as to the necessity of this procedure—it allows the anterior

chamber to empty itself so that the subsequent swelling of the fragments will not give rise to increase of tension and consequent pressure on the ciliary body with its attendant complications. The corneal wound was then seared by the application of a 5% trichloracetic acid solution applied on a cotton swab. The eye was then dressed, using a 1 grain to the dram orthoform ointment.

CASE 4. *Conical cornea* in a young girl who had a preliminary iridectomy performed within a short period, was next presented. I believe that the preliminary iridectomy simplifies the technic of this operation considerably. Unfortunately in this case, immediately after the speculum was introduced the patient strained considerably and there was a small hemorrhage from the iris before the eye was touched, that necessitated postponement of the corneal operation proper. Two operations for conical cornea on different patients were performed the week previously, in the presence of Profs. Fuchs and van der Hoeve, and shown with the corneal suture in situ.

In lieu of a clinical case the surgeon demonstrated on the blackboard the technic of his operation for the relief of conical cornea, and gave the indications for the same, and briefly referred to his belief that the cone advances because of persistent increase of tension, suggesting the possibility of a form of glaucoma as an underlying cause. In view of the technic being so fully described elsewhere in the surgeon's writings it is omitted here.

CASE 5. *Leucoma* of the cornea with anterior synechiæ and incarcerated iris in the right eye was next brought to the attention of the class. Owing to the clear cornea above, a broad iridectomy was performed thus making an artificial pupil of considerable dimensions.

CASE 6. Chronic *trachoma* with fascicular keratitis in both eyes was presented for consideration. This was an old case and had doubtless had many forms of operative treatment with mediocre success. He was brought today for *resection of the tarsal cartilage*. The eye having been prepared and the patient etherized, the upper lid was grasped by special forceps. This resembled in part the entropion forceps. It had on the distal extremity of one blade a flat oval plate—on the extremity of the other a much shortened two pronged fork, which penetrated the lid near its margin and fixed it on the flat blade, so that it could not slip off when the lid was everted by the forceps. A slotted bar was attached to the handle so that the two blades could be automatically held together. The lid having been everted by this device, a sharp, heavy bellied knife was used to outline the margins of the cartilage, which was then dissected off with scissors. The retrotarsal fold was then pulled down over this exposed area and sutured to the margin from which the cartilage had been removed, a central suture being inserted first. This was performed on both eyes.

CASE 7. The hour having expired and other surgeons having been assigned the use of the ampitheater, the rest of the clinic was held in a private operating room. The next case shown was that of a young child with *congenital nuclear cataract* in which peripheral iridectomy in the horizontal meridian had been performed. The result was very good.

CASE 8. Congenital cataract in which remote needling had been performed. This appeared to be doing very well also.

CASE 9. Remote *tenotomy for strabismus* after the method of von Graefe. This patient reported for observation only, and his primary trouble seemed to have been completely overcome.

CASE 10. Divergent *squint* operation after a method followed for years. This consisted first in a complete tenotomy of both external recti. Then with a broad forceps the conjunctiva and subconjunctival tissue, and any redundant capsular tissue immediately within the grasp of the forceps to the nasal side of the cornea were raised and snipped off. When the forceps are released this leaves a gaping area, which is then brought together with black silk sutures anchored above and below the cornea in about the median line of the globe. This is done on one eye. The primary effect is overcorrection, or internal strabismus.

CASE 11. Chronic *glaucoma in an el-*

derly man was presented for iridectomy. This was performed in both eyes using the keratome for the incision, and removing a large part of the iris well down to the base, first snipping the drawn out iris, then tearing the iris away from its base, then snipping off the separated portion.

CASE 12. *Conical cornea* in a young girl, showing the result of the operation one week after its performance. With the exception of a slight amount of lymph thrown out around the sutures in the cornea, the case showed no untoward symptoms and promised a steady rapid convalescence and a good result.

CASE 13. *Trachoma* in both eyes of a young man was next shown, and it was quite evident that it was a fresh case and had not received any operative treatment as yet. In view of this fact it was advised that he be prepared for the grattage operation first suggested by Darier and subsequently modified to meet local conditions.

CASE 14. Remote *tarsalectomy* with *peridectomy* was then presented to show the late results following these procedures. The upper lids were both smooth on their inner surfaces and the patient was experiencing considerable comfort from his eyes since the operation.

CASE 15. *Simple chronic glaucoma* in old man, showing no indications for operation was next shown. Eserin was ordered.

CASE 16. *Chalazion* of considerable proportions in a colored man was next in order, but was referred to the outpatient department for operation—opening up the chalazion by vertical incision, then scooping out the contents of the sac.

CASE 17. Pronounced *leucoma* of the cornea, in a patient who had one eye in good condition following some operation, consulted for advice concerning the leucoma but was advised to leave the eye alone.

CASE 18. Remote *cataract* extraction in the right eye with discission of the left eye was next in order. The aphakic eye was in good condition and no interference was recommended.

CASE 19. Chronic suppurative *dacryocystitis* in a woman was assigned to Dr. Coghlan of Portland, Oregon, who performed an operation he devised for the treatment of these cases. Briefly it consisted in exposing the tear sac after the manner of Meller, then incising it, and then drilling into the nose with an electrically driven drill. This is a reversal of the West method of reaching the sac from below thru the nose, and also bears some similarity to the method of Wiener of St. Louis. The patient was seen Nov. 6, and has made a good recovery. [Dr. J. Shelden Clark, of Freeport, Illinois, read a paper before the Minnesota Academy of Ophthalmology and Oto-Laryngology, at Minneapolis, January 11, 1915, on "The West Intra-Nasal Partial Resection of the Tear Sac for Dacryocystitis, Dacryostenosis, Phlegmon and Epiphora," in which he reports excellent results. The operation is very similar to that of Dr. J. N. Coghlan.]

ANNOUNCEMENT.

Washington International Congress.

The railway passenger associations of the United States and Canada offer the members of the Congress and their families *reduced rates* (a fare and a half for the round trip) under certain conditions. Upon purchasing a regular one-way ticket to Washington, a certificate should be obtained from the ticket agent. This certificate must be deposited with the Committee of Arrangements upon registering at the headquarters of the Congress, before April 27. Return tickets will be valid until May 6 inclusive. From the Pacific Coast the regular tourist rate is available.

The Presession Volume and Program will be mailed to members.

Fuchs' Lectures in Chicago.

The course of lectures by Prof. Fuchs, of Vienna, will be given in Chicago, April 10 to 20 and May 8 to 18, Mondays, Tuesdays, Wednesdays and Thursdays, from 5 to 7 P. M. Address Dr. E. V. L. Brown, 122 South Michigan Ave.

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THE HEMIOPIC PUPIL REACTION.

Ever since Wernicke in 1883 called attention to the distinction that the presence or absence of a pupil reaction to light should make between lesions of the optic tract peripheral to the corpora quadrigemina and lesions of the optic radiations or cortex, the importance of such discrimination has been appreciated by both ophthalmologists and neurologists.

The theoretic basis for it in anatomy and physiology, the reflex arc passing from visual tract to the motor tract thru Gudden's fibers in the anterior corpora quadrigemina, is perfectly clear and universally accepted. Nevertheless it is safe to say that the symptom has rarely proven of practical value, and of recent years has been regarded with skepticism as to its reliability by many clinical workers.

The difficulty seems to have been as to throwing light into the eye in such a way that it should influence the photomotor fibers from one half of the retina, and not those from the other half. To overcome this difficulty, Hess and others following his example, have endeavored by elaboration of apparatus and refinement of method to confine strictly the light falling on the retina to one lateral half of the pupillomotor area. But the results of such refinements have not added much to the practical usefulness of the test.

J. H. Fisher, departing from this line of endeavor has sought, not to confine the light to one lateral half of the retina, but to make it clearly predominant on that one half. Doing so he claims that the method gives us an absolute proof of the presence or absence of the Wernicke reaction. In his Presidential Address before the Ophthalmological Society of the United Kingdom, last year he thus describes his method. "The patient is stood at right angles to the plane of a well lighted window; the observer, facing his patient, covers the eye remote from the window with one hand. Alternately shading and unshading with the other hand the eye next to the window,

he notes the pupillary response obtained; having turned the patient thru 180° (right about turn) he repeats the same procedure, and observes whether the response of the pupil now under observation is greater or less than that of the first eye tested. The parallel rays of light impinge in each instance on the nasal half of the retina; homonymous halves are not stimulated in the two observations; any difference in the response of the two pupils indicates the presence of Wernicke's reaction. The test is perfectly simple in its application; the two pupils will react equally if the lesion causing the hemianopia is above the primary basal connections of the optic tract. In a case where the lesion involves the optic tract, the pupil on the side opposite to the lesion gives practically no response at all; the pupil of the eye on the same side as the basal lesion responds briskly; there is no uncertainty about the observation. By this simple method the Wernicke's pupillary reaction can be proved absolutely, and full value can be attached to it, whether a positive or a negative result is given."

Such a procedure and such a claim seem perfectly rational. The wonderful discriminating power of the retina is exercised, not by receiving light on some parts of the retina, while others are in darkness. Under ordinary conditions of seeing, light falls on every portion of the retina—focused light thru the pupil and diffused light thru the iris and the sclera. Yet because of relatively slight differences of stimulation of different retinal elements there arises all the different visual impressions. The light reflex of the pupil exists, apparently, to grade the general illumination of the retina so as to give a maximum of discrimination between varied stimuli that fall on different parts of the retina. It is certainly reasonable to assume that it can be elicited, by observing the behavior of the eye under conditions approaching those of ordinary seeing.

We need to be reminded now and then that laboratory conditions and laboratory results sometimes differ so widely from those of ordinary clinical observations, that it is not safe to trust them to the exclusion of more simple and common procedures, or to make them supreme in the realm of practical diagnosis. E. J.

SUCCESS IN CATARACT EXTRACTION.

There are fashions in surgery as there are fashions in clothes and note paper. They do not all come from Paris or Vienna. They emanate from every center of great surgical activity. Each has its vogue and is displaced, but each leaves some permanent impress upon the practice of the future. What has been the practice before never returns to usage exactly as it was.

One who has watched the literature and practice of cataract extraction for a generation can trace distinct cycles of change in that time. Iridectomy, that Graefe's leadership had caused to be practiced universally, fifty years ago, was largely displaced by simple extraction thru the influence of the example of Herman Knapp. But iridectomy was not wholly given up. Simple extraction has again declined in frequency, altho it still is done to a considerable extent. In this way have come the variations in procedure that seem suited to particular cases, or that appeal strongly to individual operators.

The range of such variations is large. Some operators expressed the cataract by pressure of the fingers alone, using no instrument but the knife for the operation. Others control the lids with strabismus hooks or similar devises; the majority still prefer the stop speculum or blepharostat, and to fix the globe with the ordinary fixation forceps applied at the limbus, or others that penetrate the sclera, or seize a rectus tendon, usually the superior to secure a complete certainty of preventing the ocular movements. Some habitually wash out the lens debris from the anterior chamber; others never attempt it.

It is more than likely that the operation of extraction in the capsule, by ex-

pression applied at the upper part of the cornea (Wright), or at the lower part of the cornea (Smith), or by suction either with Barraquer's erisophake, or one of the modifications of it, or the extraction by seizing the capsule with appropriate forceps, will come to occupy a similar place, as a method preferred by some; while others rarely or never attempt to remove the lens in the capsule, but continue to follow the method with capsulotomy.

Success in cataract extraction has never been achieved by following rigorously the technic of another surgeon, no matter what success he has achieved by it. Every one who desires to succeed in this most elaborated of all surgical operations should welcome and carefully study every new suggestion for modifying the technic of the operation. But he should put in practice only such procedures as he has mastered, and which seem to him most rational and effective. A good operation presupposes long and minute study of every one of its steps, and careful consideration of its dangers; perfect familiarity with every needed manipulation, a quick perception of every indication that arises while executing the operation, and wide resourcefulness for every emergency.

The important point is not the choosing the most experienced surgeon, the wisest teacher, and reproducing as closely as possible the method he practices; but the careful trial and training of one's own powers, the slow development and perfect mastery of what is really one's own method. The best operation will always be to some extent peculiar to the individual operator who practices it. Even tho it may be modified from time to time by the suggestions and example of others, it will still remain peculiar to the man who has developed it.

This operative individuality extends to all the conditions and surroundings, and to the assistants that contribute a necessary part to the success. The best showing of any operator will be made in his own clinic, with his usual assistants and conditions. The accounts of Col. Smith's operations in this country in the last number of this JOURNAL demonstrate the difficulties and dangers of operations done under unfamiliar conditions with unaccustomed assistants, no matter how good surgeons these assistants may be when doing their own operations. The great service rendered by such leaders as Col. Smith or Professor Barraquer is not that they teach a method that others must learn from them and imitate; but that they put before every serious student of their operations, new points of view and new experiences, which he can ponder and try, and which may suggest to his mind some special modification of his own procedure that will make it still more successful. E, J.

AN INTERNATIONAL CONGRESS OF OPHTHALMOLOGY.

In 1857 there was held in Brussels the first meeting that adopted the name "The International Congress of Ophthalmology." Since then, ten such gatherings have been held, nine of them in various cities of Europe, and one in 1876 in New York City. The third, which assembled in Paris in 1867, adopted a brief form of organization; which provided for the continuation of the series by establishing an international committee; but placing practically the whole power and responsibility for arranging each congress upon the local organization of the city and country in which it was held.

The twelfth congress of this kind was to have been held at St. Petersburg, Russia, in August, 1914. The breaking out of the great war prevented it from convening, and incidentally furnished some exciting experiences for Americans who had gone to Europe to attend it. The international committee charged with the continuation of this series of congresses still exists; that is some of its members still survive, altho they may never have met since the Naples Congress 13 years ago. The fate of the Russian

ophthalmologists who made most of the arrangements for the twelfth congress we do not know; and it will probably be many years before a successful international congress can be held in Petrograd. In view of this it is possible that such members of the old committee as can take any joint action might wish to adopt the Washington Congress as continuing the former series, calling it the Twelfth or Thirteenth. But we believe a more desirable outcome is possible.

Those who attend the Washington Congress, from America, will feel that the opportunity of hearing and meeting men like Collins, Elliot, Lister and their colleagues from England; Lapersonne, Morax, Magitot and other writers and teachers from France; Barraquer, Castresana, Poyales, and others from Spain, Gullstrand, Nordenson, Gallemaerts, and those from other medical centers of Europe, as well as the members from Canada, Mexico, Cuba, Argentina, Chili and Peru and other American nations, is an opportunity that ought to be available more than once in forty-five years. America with almost as many trained ophthalmologists has a right to the same advantages as Europe, of meeting to discuss the problems in which ophthalmologists are interested; and it is possible to have these advantages without robbing the old world of any of its needed opportunities.

The name chosen for the Washington Congress differs from that used for preceding congresses of the kind by a small word, with very important implications. *"The* International Congress of Ophthalmology" meant there was but one, and that was it. *"An* International Congress of Ophthalmology" means there may be many such congresses and this is one of them. It has been suggested that it might be well not to call this an "International Congress," since some nations could not be expected to take part. The name "American" or "Pan-American" has been mentioned as more appropriate. But surely a congress in which the ophthalmologists of 20 different nations join, half from the eastern and half from the western hemisphere, deserves the name "International." No other designation is so appropriate. The name "Pan-American" implies exclusion of other parts of the world, or participation only as outsiders invited for the one occasion; but this we do not want. A large part of the interest of the Washington Congress would have been lost, if the majority of papers had not been offered by writers from other countries; and those from Europe add most to its value. We want to meet these men, and meet them on the basis of full democracy in our common membership and devotion to our profession.

Surely such a Congress is "international," altho to call it "The World Congress of Ophthalmology" might have been inappropriate. The fact is no "World Congress" of ophthalmology has ever been held, nor is it likely to be in the near future. The gatherings at Naples and Lucerne, which were the largest predecessors of the one to be held this year, did not have representatives of half the nations of the earth in which scientific ophthalmologists were working and contributing to the world's literature of ophthalmology. The World Congress is still a dream of the future. Meanwhile we can have "International Congresses" worthy of the name, and the more we have of them the better. It was not mere boasting and self congratulation that some in attendance at the Vienna Congress, last August, spoke of it as "international," altho it used but one language.

It may be awkward to designate a particular gathering simply as "an" international congress. But this difficulty is easily overcome by using the name of the city in which the gathering is held. Thus we can speak of the Washington International Congress, the Buenos Aires Congress, the Montreal, or Habana, or Mexico International Congress of Ophthalmology, in designating the different gatherings which may be, and we hope will be, held in such a series. These gatherings will

not in the least interfere with similar congresses to be held in London, Paris or Vienna. The proportion of oculists in the world who can attend any one of these gatherings will be very small. It is greatly to be desired that more of us should be able to take part in them, at least two or three times in a professional life time; and the only way to make this possible is to make such gatherings more frequent, and to diffuse them more widely thruout the world.

In the United States we have three organizations that can fairly claim to have "national" annual gatherings of ophthalmologists. There are also annual meetings of organizations like the Pacific Coast Oto-Ophthalmic Society and the Colorado Congress, which have no distinct geographic limits. Among all these organizations there is overlapping of territory, but it does not interfere with the success of their meetings or their usefulness to the profession. The existence of such rival gatherings acts as a stimulus, keeps alive wide professional interest and adds to the total number of those benefited by such meetings. Two or more series of international congresses devoted to ophthalmology, drawing members from many of the same countries, would undoubtedly extend to larger numbers the benefits of such opportunities of professional contact, and seem in every way desirable. This will hold true whether these are one language congresses, like those of the Société Francaise or the Heidelberg "Ophthalmologische Gesellschaft," or are arranged on the broader basis of the Washington Congress.

E. J.

A NEW JOURNAL.

The first number of a journal called *The Eye, Ear, Nose and Throat Monthly* comes to us from Chicago. It is issued by "The Professional Press, Inc.," and in general makeup closely resembles *The Optometric Weekly* which has been published by the same company for several years.

The editor of the new monthly is Thomas G. Atkinson, M.D., whose "Oculo-Refractive Cyclopedia and Dictionary" was recently brought to the attention of our readers. The first number contains but one paper relating to ophthalmology, and that seems to have been already published in another medical journal. However, it gives abstracts of eight other articles relating to the eye, three of which appeared in this journal. The form of the monthly is attractive and it has been well edited.

E. J.

BOOK NOTICES.

Die Krankheiten des Auges im Zusammenhang mit inneren Medizin und Kinderheilkunde. Prof. Dr. Heine, Direktor der Universitäts-Augenklinik, Kiel. Large octavo, 560 pages, 219 illustrations. Berlin, Julius Springer. 1921.

This account of eye diseases in relation to internal medicine and the diseases of children, is one volume of the Encyclopedia of Clinical Medicine, edited by Langstein, von Noorden, Pirquet and Schittenhelm, of which 14 volumes have now been issued, beginning in 1914. It is one of the most complete, as it is the most up to date and best illustrated of the books that have appeared dealing with this subject.

It is divided into two parts, the first of which takes up symptomatology, the eye symptoms of general diseases. In this part are found 210 of the 219 illustrations, and a majority of them are printed in colors. They include reproduced photographs of patients, sections of tissues, and especially color sketches of the iris, the ocular fundus, and charts of the fields of vision. There are also numerous diagrams showing the relations of parts of the nerve tracts involved, actions of the ocular muscles, positions of opacities in the media, etc. A rather striking colored illustration shows the movements of light and shadow in the pupil and on the face, as seen in skiascopy in hyperopia and in myopia.

This first part deals first with the objective examination of the eye and

then with the study of subjective symptoms. In the former the headings are: the external examinations, lateral illumination, simple ophthalmoscopic illumination of the media, studies with the mirror and convex lens, the shadow test, and study of the fundus conditions as seen in the inverted ophthalmoscopic image, and a very brief account of what is revealed by the direct ophthalmoscopic examination. This last seems quite inadequate when we consider the medical importance of the slight retinal and vascular changes which the ordinary hand ophthalmoscope can only show in the erect image. It should be mentioned, however, that under lateral illumination, the corneal microscope and slit lamp examination is described, and some of the things noticed in connection with the indirect method would presuppose the higher magnifying powers of the large demonstration ophthalmoscopes. Many of the ophthalmoscopic changes are pictured as seen by both the ordinary and the redfree light. These plates, altho not of the highest order, furnish a very fair atlas of many ophthalmoscopic conditions.

The subjective investigation is opened by a brief discussion of pain, visual disturbances with objective evidences, and visual disturbances evidenced subjectively. Then it takes up in succession visual acuity, modified by refractive anomalies and accommodation; perimetry, including scotomas and the lesions producing them and hemianopsia; the color sense, light sense, binocular vision and disorders of the external ocular muscles.

The second part, rather more than half the book, is devoted to general diseases and the associated eye symptoms. It begins with toxic conditions due to substances like alcohol, nicotin, etc.; then those produced by various drugs used medicinally, poisoning due to occupations, autointoxications and poisons due to infections, as botulism. Next come the infections, beginning with tuberculosis which is accorded space (33 pages) quite in accord with what we now understand of its importance. Syphilis is accorded equal space; and then the acute exanthems are taken up.

Shorter sections are then given to the female reproductive organs, including pregnancy, then to diseases of the respiratory organs, disorders of the digestive organs, kidneys, disorders of metabolism and nutrition, diseases of the circulatory organs, of the bones, joints and muscles; diseases of the brain, spinal cord and nerves; and finally hereditary eye diseases.

The book is not free from double mention of the same topic, that amounts to repetition. Thus optic atrophy is treated at length in Part I under objective examination with the ophthalmoscope, where it is classified according to its clinical forms. Again under subjective examination many of its important symptoms are discussed. Finally in the second part of the book atrophy of the optic nerve requires mention and some discussion under the heading of each agent or disease that is liable to cause it.

This book has an extended table of contents, 15 pages. It has also, what is often lacking in books published in Continental Europe, an alphabetic subject index of 15 pages. It is on the whole an excellent reference book for the German reading ophthalmologist.

E. J.

Transactions of the Ophthalmological Society of the United Kingdom. Vol. XLI, Session 1921, with list of the Officers, Members, etc. 590 pages, 12 plates and 91 illustrations in the text. London, J. and A. Churchill.

In practical and permanent scientific value these transactions are superior to those of any other national organization of ophthalmologists in the world. The volume represents not only the work of the Annual Congress of the Society that publish them; it includes selected papers presented to the Oxford Congress, 9; The Midland Ophthalmological Society, 8; The North of England Ophthalmological Society, 10; The Irish Ophthalmological Society, 13; and The Ophthalmological Society of Egypt, 4; besides the report of

the meeting of the Scottish Ophthalmological Club at which 22 cases were presented.

In addition to the above, which illustrate the extent of the British Ophthalmic Empire, we find here the address of the President, J. Herbert Fisher, the Bowman Lecture by E. Treacher Collins, discussions on the Psychology of Vision in Health and Disease, opened by papers by Prof. Spearman and J. H. Parsons; and on the Treatment of Manifest Concomitant Strabismus, opened by papers from Claud Worth and A. J. Ballantyne, and 29 papers, mostly clinical, read at the Annual Congress of the Society.

It should be noted that the average length of these papers is less than five pages each. We know of no ophthalmic transactions in any language that contains so much of practical interest in the same space. The present volume is the largest the Society has yet published. In form it closely resembles the others of the series that have preceded. We are glad to see in this one some of the colored plates for which these transactions have been notable in former years.

E. J.

Cataract and Its Treatment. Lt. Col. Henry Kirkpatrick, I.M.S. (retired). Published by Henry Frowde and Hodder and Stoughton, London; Oxford Press, American Branch, New York City.

This book contains 201 pages with 70 illustrations, most of which are taken from other works, with due credit. The press work is excellent, the paper and printing being very pleasing to the eye, and there are very few typographic errors. The work is divided into twenty-six chapters, with a table of contents and an index. Each chapter is followed by a list of several references.

The subject matter is largely a résumé of our knowledge of the subject, with observations drawn from the writer's experience, especially at the Madras Hospital. The author prefers the extraction with capsulotomy method to any form of intracapsular operation. Of special interest are the chapters on "Treatment after Operation," including treatment of complications, and "Modification of Operation and Technic." The reviewer cannot agree with his advice as to conjunctival disinfection preliminary to operation, as the author admits that it may result in considerable reaction. Nor can he approve of the apparently routine use of silver nitrat at the subsequent dressings, unless of course there are distinct indications for its use.

For a beginner in cataract work, and for one who desires to review the subject without wading thru a voluminous literature, the book is to be highly recommended.

C. L.

Clinical Ophthalmology for the General Practitioner. A. Maitland Ramsay, Glasgow, Scotland. London, Henry Frowde and Hodder and Stoughton.

As the result of a long and active professional life, Ramsay has brought out this new textbook, the subject matter of which has been treated in the most modern manner, from an outside view, i.e., from the standpoint of general medicine rather than as schematically described in most textbooks from that of the specialist. The author spent ten years in general practice before he specialized in eye diseases, and has ever practiced ophthalmology from that standpoint.

He has brought the treatment of diseases of the eye into line with everyday practice. He tries to teach something that hitherto, and doubtless always will be an impossibility, i.e., to make a man who is continuing with general practice able to treat his eye cases. While we concede that the family doctor should know enough ophthalmology to attend to the incidental and trivial affections and to acquaint himself sufficiently with the important conditions and changes in the eye which result from, or are incidental to general diseases; yet the field of medicine is so large that no man can master the details of the many procedures and the finer operations of this specialty. It is certainly highly inadvis-

able for the general practitioner to attempt the measurement of eyes and the prescription of glasses, for work done by such a man in such a manner and of necessity with such few instruments of precision which he is able to secure—or even if he had them—to properly use—is on a par with that of the ordinary optician; and we all know the dangers of procrastination to which such inefficient services lead.

Then, too, the entering of the general practitioner, even the general surgeon, into the finer technic of ophthalmic practice is something that should be discouraged, for the results thereby obtained are not as beneficial to their patients as those which are given by specially qualified men. Be this as it may, it is the opinion of those who are well qualified in General Medicine as well as in Ophthalmology.

To return to the book, it is one with which the oldest as well as the youngest ophthalmologist will be particularly pleased, not only with the subject matter, but with the method of handling. The reviewer has been impressed with the twenty-first century style of writing, and particularly with his therapeutics, to which a special chapter of therapeutic notes is given in seventy pages. His discussion of the workingman's compensation laws of Great Britain is apropos at this time. It is well illustrated with colored plates, those of the exterior portion of the eye being quite satisfactory, and black and white inserts. The drawing is especially good. The colors not quite true, doubtless due to difficulties in technic of reproduction—especially is the latter to be seen in his plate of fundus conditions.

On the whole the work is well worth purchasing and should meet with a good sale.

H. V. W.

Transactions of the Section on Ophthalmology of the **American Medical Association,** at the Seventy-Second Annual Session, held at Boston, Mass., June 6 to 10, 1921. Chicago, A. M. A. Press.

We find in this volume of the papers and reports read before the 1921 meeting of the Section on Ophthalmology A. M. A., a marked departure from previous years. To begin with we have three essays by authorities in other departments of medicine, on Focal Infection by Billings, The Visual Pathway and Paranasal Sinuses by Schaeffer, and Diseased Teeth as Possible Foci of Systemic Infection by Brun, which crystallize the present knowledge of the subject in relation to the eye.

Of the purely ophthalmic papers, the colloquial essay of Lt. Col. Smith, and his discussions on night blindness; the extensive study of Primary Intraneural Tumors, with its most excellent illustrations, by Verhoeff; the papers on plastic operations by Gross and Wheeler, the essay on the Blind Spot by Gradle, and the study of 1,421 senile cataract operations by Parker, are noteworthy.

Perhaps the most important contributions are the reports of committees which show most exhaustive study of the several subjects, and which have been presented in particularly readable tho condensed forms. That of the Committee on Estimating Compensation for Eye Injuries does not agree with those of the Governments of America, Great Britain, Italy or France, and may be later revised to conform with them. For instance it allows 110% for loss of an eyeball, and additional compensation for cosmetic defects. Certainly a 100% basis should be the limit. France used to have such a scale, but has given it up. That on protective glasses is short and to the point. On Local Anesthetics, despite the newer and in a measure satisfactory substitutes, the report shows that practically 98% of operators confine themselves to cocain. The committee believes that it is highly advisable to find, if possible, a synthetic anesthetic which will take the place of cocain, less toxic, less expensive, not habit forming, and equally efficient. The report on ocular muscles is highly scientific, but of practical value. The Committee on Trachoma presents an interesting and highly valuable article showing that trachoma is really not prev-

alent in America, except in a few malfavored localities. That there is a radical distinction to be made between this dangerous disease and the harmless one of folliculosis, and that the recent furor in the Southern States about trachoma in the public schools is unfounded. The report on Prevention of Hereditary Blindness makes recommendations for further study of these cases, and education of the public against marriage of those that are predisposed.

Descriptions of new instruments and a list of Fellows registering during the last five years is appended. Would it not be better to give a list of all the members whether attending or not, for only a minor portion of physicians in the A. M. A. are able to attend regularly?

H. V. W.

Pacific Coast Oto-Ophthalmic Society. Transactions of the Ninth Annual Meeting. Seattle, Washington. July 14, 15, 16, 1921.

This society embraces two hundred and seven members, taking in the men who are located west of the Rocky Mountains, and mostly on the Pacific Coast.

The papers of the last meeting were of considerable value. Those giving case histories showed evidences of full and complete study, and fully come up to modern requirements. The president, Dr. George Swift, in his address, spoke upon Hospital Standardization and the necessity of broader training with less specialism.

Of the papers presented, and herein published, that by William House, neurologist, of Portland, Oregon, on "Neuropsychiatric Views of Some Common Disorders of the Eye, Ear, Nose and Throat," showed the tendency of modern medicine, and the full discussion corroborated his findings. That by Neher on a somewhat similar subject, "A Few of the Ocular Manifestations of Hysteria and Their Relation to Compensation," was of the same character. Veasey on "Some Observations on the Extraction of Senile Cataract," gave a most succinct paper, giving his personal method, with the result of more than thirty years active study. This received considerable discussion, lead off by Lt. Col. Smith of India. Mosher, of Boston, on "Reestablishing Intranasal Drainage of the Lacrimal Sac," gave the description of this modern operation with the results of a large series of cases.

Lt. Col. Smith spoke upon early cataract. In connection with the meeting he held an operative clinic of twenty-two expressions of cataract, the subsequent results of which were all good. This was followed by E. R. Lewis, of Los Angeles, on "Remarks on the Tests of the Vestibular Apparatus." The paper of Kiehle, "Report of Case of Phlegmon of the Conjunctiva," was published in full in the January issue, 1922, of the AMERICAN JOURNAL OF OPHTHALMOLOGY. That of Keyes is a marked example of Glioma Exophytan of the eye.

An extensive report of "Industrial Insurance and Indemnity Rules of the Governments of U. S. of America, Great Britain, France, Italy, Belgium and Germany, with Notes on State Medical Aid Laws," was submitted by Würdemann, of Seattle, the ophthalmologic portion of which will be published in abstract in this JOURNAL. A number of ear, nose and throat articles were also rendered

H. V. W.

Transactions of the American Ophthalmological Society, Volume 19. Fifty-seventh Annual Meeting. Pages, 395, illustrations, 25 in text, and 22 plates, 2 in colors. Published by the Society, T. B. Holloway, Secretary.

This volume contains the papers read at the meeting of June, 1921, held at Swampscott, Mass.; and the theses of candidates accepted for membership in the Society at this meeting. These theses are by William L. Benedict, of Rochester, Minn., on "The Character of Iritis Caused by Focal Infection"; Nelson M. Black, of Milwaukee, on "Suggestions for a Uniform Method of

Estimating Loss of Visual Efficiency Following Industrial Eye Injuries; E. E. Holt, Jr., Portland, Me., "The Compensation Problem in Ophthalmology." These have not been published elsewhere. They occupy about one-sixth of the volume. Of the papers read at the meeting of the Society, some of the more important have been published in this JOURNAL. Nearly all of them are valuable contributions to the literature of practical ophthalmology.

The acme of interest in the volume is reached in the discussions that accompany some of the papers, for among the members a large proportion are leading teachers and practitioners of ophthalmology. The biographic sketches relate to three deceased members who have contributed both to the transactions of this Society and to other portions of ophthalmic literature, viz., Arthur Matthewson, of Brooklyn; George T. Stevens, of New York, of whom excellent portraits are given, and Adolf Alt, of St. Louis. Of the original members of the Society but two now remain, William H. Carmalt, of New Haven, Conn., and F. P. Sprague, of Boston, Mass. The total number of members is now 193, and of these 102 were in attendance at this meeting. The work of this organization is closely interwoven with the progress of ophthalmology in America for the last 58 years. E. J.

The Ophthalmological Society of Egypt, Bulletin of 1917. Pages 108 with 13 illustrations. Cairo, printed by M. Roditi and Co.

In the perturbations of war this publication has just reached us. Altho the title of the bulletin is published in its three "official languages," Arabic, French and English; in this number all the papers and discussions are given in English. There are notable papers by Fischer and MacCallan on the incidence of primary glaucoma in Egypt, where it is much more common than in other parts of the world, 2.08 per cent of 347,676 cases.

E. J.

South America from the Surgeon's Point of View. Franklin H. Martin, M.D., F.A.C.S. Director General of the American College of Surgeons. 12 mo., 345 pages, illustrated. Chicago, Fleming H. Revel Co.

The American College of Surgeons is preparing to extend its domain over all the western continent. Already two scouting parties have gone over the ground in South America, and this little volume is in the nature of a report on their observations with regard to medical men, and medical institutions in that continent. To those who know other countries largely thru the headlines of newspapers, it may come as a surprise that there are some of the most highly trained medical men, and some of the finest hospitals in the world in that quarter of the globe.

Of especial interest to ophthalmologists just now is a vocabulary of Spanish and Portugese equivalents of English words and phrases which occupies 38 pages. This might assist those who will attend the Washington Congress in following some of its discussions. There are also 32 pages packed with a summary of facts, historic, geographic, political, social and industrial. To one whose conceptions of the sizes of countries are founded chiefly on the maps of our school geographies, it is somewhat startling to learn that Brazil is larger than the United States.

The volume is made very attractive by the reproductions of photographs that it contains. The subjects of these are surgeons of the cities visited, officials of the various countries, views of hospitals, medical schools and public buildings, and many beautiful landscapes.

E. J.

CORRESPONDENCE.

Later Effects of Peripheral Iridotomy.

To the Editor: Since writing the article on Peripheral Iridotomy for Chronic Glaucoma, published in the December number of this journal (v. 4, p. 889), I have done 14 Curran operations on 12 eyes. I have continued to

be impressed with the remarkable immediate results of the operation, the tension almost invariably going down to normal or below, frequently from such tensions as 60 to 70 mm. Hg. (Schiötz), and staying there for a period of several months in the cases most likely to be affected favorably; i.e., in cases where there was a decided shallowing of the chamber.

In my paper, however, the results were given as provisional and the final decision as to the permanent value of the method remained to be determined. Now, a year or so after I began to do this operation, while some of the patients have retained the tension which they had shortly after the operation, two cases have returned with an increase of tension, not reaching, however, the point obtained before the operation. In one of my later cases, in which the iridotomy reduced the tension at once from 68 to 17, the tension in the course of a month has gone back to 35, while in a number of cases there has been shown a slight tendency upward; going from 10 to 20 immediately after the operation, up to 25 or 30 within the next few weeks.

In all of these cases I had tried to get along with a minimum amount of eserin (in some cases not using it at all), and on increasing the eserin to one drop of a 1/5th of 1% solution four to five times a day, the tension has receded to from 20 to 25. This convinces me that the continued use of eserin will probably be necessary in nearly all of these cases, and furthermore, it has made it necessary to still further reserve an opinion as to the final value of the operation. But even if it is necessary after the iridotomy, to keep on using eserin for the rest of the patient's life, this is a small matter if by so doing we can save the eye from a more serious operation. It may be noted that the advocates of cyclodialysis, also, have found that it is necessary to keep up the use of eserin if the favorable results of the operation are to be maintained.

One other qualification in the use of peripheral iridotomy I have obtained from a personal talk with Dr. Curran, who has reached the conclusion that where a single successful peripheral iridotomy has proved insufficient, a second one usually accomplishes nothing more permanent.

With regard to the technic, I am more than ever impressed with the fact that it is inadvisable to try to force a counterpuncture in the iris; if, after first penetrating the iris, the counterpuncture is not readily made. In such cases, it is best, after simply puncturing the iris, to cut up and a little forward against the cornea, keeping up a slow but steady pressure with a very slight sawing motion for a few seconds. Then the knife should be withdrawn very slowly, keeping up a gentle pressure for the first part of the withdrawal. By adopting this plan, I have succeeded in making a good peripheral hole in all but one of my last twenty operations, but as before indicated, the knife-needle must have a very sharp point and edge.

HAROLD GIFFORD,

Omaha, Neb.

ABSTRACTS.

Eckmann and Konings. A Case of Scabies of the Lids and Irritation of the Conjunctiva. Le Scalpel, Feb. 19, 1921. No. 8.

In this case, there was general scabby irritation of the hands, arms, legs, abdomen, thorax, back, face, scalp and eyes. The bulbar conjunctiva was a vivid red; and irregularly scattered over it, there appeared little yellowish points the size of pin heads. These were cone shaped and slightly elevated, and each one contained a parasite. The same yellowish points were present on the palpebral conjunctiva. The conjunctival cul de sacs were thickened but showed no yellow spots. Connected to all these protuberances were fine red lines. Secretion was not very abundant. The pupils were contracted and the iris hyperemic. The subjective symptom was incessant itching, more excessive at night, preventing sleep. Treatment consisted of bathing the parts with hot sublimat 1/4000 and applications of a pommade of calomel 5%. This resulted in a cure in three days. M. D.

Van Duyse, G. M. Permeability of the Cicatrix, Following Sclerectomy for Glaucoma Simplex.

Following the iridosclerectomy of Lagrange or the Elliot trephine, the cicatrix remains permeable. Hamburg's experiment upon the normal eye of a rabbit proves nothing to the contrary because, in such an eye, the natural means of excretion continue to function. In a glaucomatous eye, on the other hand, the lymphatic channels are less permeable or entirely closed.

M. D.

Gonzales, J. de J. Mycotic Tumor of Orbit. An. de la Soc. Mex. de Oft. y Oto-Rino-Lar. Febr., 1921.

When the author first saw his patient, a woman of 21, she had complained of disturbed motility of the left eye for some months. This rapidly progressed to complete paralysis. There was a swelling behind the left ear which interfered with mastication. Vision left eye was 1/10. The eye was turned out with slight exophthalmos. There was complete third nerve paralysis and paralysis of accommodation. The skin of the lids, the conjunctiva and the cornea were anesthetic and an ulcer of the cornea from exposure was present. Tuberculin tests were negative and there was no specific history. The corneal ulcer healed under local treatment after one month. The other signs, however, progressed slowly, not being influenced by mercurial treatment. An incision in the upper margin of the orbit was made and a small amount of pus escaped without, however, influencing the symptoms, whose cause remained undetermined.

After this, the patient was not seen again for four years. At this time, the eye protruded beyond the lids, vision was zero, iris was atrophic, and a cataract had developed in the left eye. There was a complete ankylosis of the jaw, and scars, apparently of broken down lymph nodes, on the neck and breast. Areas of active ulceration involved the sternum and parietal bones. Smears of pus from the region over the parietal bone showed a fungus consisting of interlaced threads with pointed terminal conidia. Under two to three drams of potassium iodid daily with iodin-potassium iodid solution applied locally to the lesions, they healed promptly and the exophthalmos decreased. In six months, there is no proptosis but a complete paralysis of the ocular muscles remains and vision is zero. The globe is apparently fixed firmly by adhesions as it cannot be moved to one side even by pressure with the fingers. Tho no cultures were made, examination of the fresh material seems to indicate that the infection was due to Sporotrichum Beurmanni. The author emphasizes the importance of being on the lookout for such rare infections, as in this case, early diagnosis would have prevented permanent lesions. (Bibliography and five illustrations.)

S. R. G.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph C. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. G. McD. Van Poole, Honolulu; Dr. E. B. Cayce, Nashville Tenn.; Dr. Gaylord C. Hall, Louisville, Ky. Volunteers are needed in other localities.

DEATHS.

Arthur C. Davis, Durango, Colorado, aged fifty-three, shot himself through the head, December 29th, while suffering from a nervous breakdown.

Dirk A. Kuyk, Richmond, Virginia, aged

fifty-seven, died December 16th, from pneumonia.

John Rankin, Brooklyn, aged seventy-six, died December 21st, from acute dilatation of the heart.

James C. Shelton, Chillicothe, Missouri, died at the local hospital from chronic nephritis, December 5th, aged fifty-nine.

The death of Dr. F. Stocker, who was in charge of the Eye Infirmary at Luzerne, Switzerland is reported.

PERSONALS.

Dr. Harry Gradle of Chicage is taking a short vacation trip to Panama.

Mrs. Emily C. Jackson, wife of Dr. Edward Jackson, of Denver, died January 28th.

John Herbert Parsons has had the honor of Knighthood bestowed upon him by King George.

Dr. Willis O. Nance left Chicago about the middle of January, for a six weeks' vacation in Southern California.

Dr. H. Alexander Brown of San Francisco is taking a trip through Japan, China and the Philippines.

Drs. Marvin M. Cullom and William G. Kennon will take up the work of Dr. Hilliard Wood who has resigned his professorship of opthalmology in the Vanderbilt University.

Drs. Magruder and Neeper of Colorado Springs, Dr. Ritchie of Trinidad, and Drs. Shields and Bane of Denver, attended the Fuchs lecture course at Houston, Texas.

Dr. V. M. Hicks, former House Surgeon of the New York Eye and Ear Infirmary, has recently joined the firm of Drs. Lewis, Battle and Wright, of Raleigh, North Carolina. Dr. Hicks' practice will be limited to diseases of the eye, and the firm will now be known as Drs. Lewis, Battle, Wright and Hicks.

In the Union College magazine for February, Dr. Alexander Duane of New York reminds his fellow alumni of the athletic record of Dr. Charles M. Culver when a college student, 1874 to 1878, which culminated in his winning the amateur championship for the 440 yard dash. Dr. Culver is better known among opthalmologists for the excellent translation he made a few years later of Landolt's "Refraction and Accommodation of the Eye."

SOCIETIES.

The annual meeting of the Indiana Academy of Opthalmology and Otolaryngology was held in Indianapolis, January eighteenth.

At the February 20th meeting of the Chicago Ophthalmological Society papers were read by Dr. Thomas Faith on "Increased Intraocular Tension," and by Dr. George F. Keiper of La Fayette, Ind., on "Comparative Anatomy of the Eye."

The January meeting of the Kansas City Eye, Ear, Nose and Throat Society was held on the nineteenth, at St. Joseph, Missouri. Those participating in the program were Drs. Beck, Forgraves, Proud and Menter. There was a dinner and a clinical program.

The Louisville Eye and Ear Society held its annual meeting and banquet at the Pendennis Club, January 12, 1922. The guest of Honor was Dr. John F. Barnhill of Indianapolis, Ind., who addressed the members on the subject of "The Fifth Nerve in its Relation to Rhinology." The twenty-five members were much indebted to Dr. Barnhill for his masterly address.

The annual meeting and banquet of the Chicago Ophthalmologic Society occurred on Jan. 16th. The subject of the after dinner program was "As Others See Us," and was discussed most interestingly from the different viewpoints, by Hon. Hugh Kearns, Dr. Matheny of Galesburg, and Dr. Wm. E. Quine. Dr. Elliott Colburn, who is one of the oldest members of the Society in active practice, told some interesting facts connected with the early history of the Society.

The following officers were elected for the ensuing year: President, Dr. Francis Lane; Vice-Pres., Dr. Frank Brawley; Sec'y, Dr. Michael Goldenberg; Councillor, Dr. A. L. Adams of Jacksonville.

During the evening a number of songs were beautifully rendered by Miss Nell Bonnell Smith of the Chicago Grand Opera Company.

MISCELLANEOUS.

The Home for the Blind, Philadelphia, will share equally with the University Hospital one-half of the income from $65,000, the residue of the estate left by Mrs. Alice M. Hirst.

The U. S. Veterans' Bureau has officially taken over the Evergreen Institute for the Blind at Baltimore, Maryland, and will conduct it as a hospital for blinded veterans of the World War.

The lecture course given by Professor Fuchs at Houston, Texas, had an attendance of almost a hundred. The course was well received and the sacrifice made by men, who were in attendance from a distance, was said by all to have been more than worth while.

A bill to regulate the practice of optometry in the District of Columbia, has been introduced in the Senate by Senator Ball. Licenses are required for all opticians, who must pass an examination. The proposed legislation is similar to the law now in existence controlling the practice of medicine.

The opthalmic section of the College of Physicians, Philadelphia, announces that arrangements are being completed for a course of lectures upon "Ocular Pathology," by Professor Ernst Fuchs. They will consist of twenty lectures, illustrated by lantern slides. The course will begin about March sixth. Further information can be obtained from Dr. G. Oram Ring, Seventeenth and Walnut Streets.

Current Literature

These are the titles of papers bearing on ophthalmology received in the last three months. Later most of them will be noticed under Digest of the Literature. They are given ni English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically usually by the author's name in **heavy-face type.** The abbreviations mean: (Ill.) illustrations; (Pl) plates; (Col. Pl.) colored plates. Abst shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper. Under repeated titles are given additional references to papers already noticed. To secure early mention copies of papers or reprints should be sent to 318 Majestic Building, Denver, Colorado.

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Jackson, E. Instruments for measuring orbit. (2 ill.) Sec. on Ophth. A. M. A. 1921, p. 342.

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Bulson, A. E., Jr. Butyn. A. J. O. 1922, v. 5, pp. 56-60. J. A. M. A. 1922, v. 78, p. 343.

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Ferree, C. E., and Rand, G. Effect of variations in intensity of illumination on eye functions. (8 ill. dis.) Trans. Amer. Ophth. Soc. 1921, v. 19, pp. 267-297.

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